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THE

PENNY CYCLOPÆDIA

OF

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VOLUME XIV

LIMONIA——MASSACHUSETTS.

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LIMO'NIA, a genus of plants of the natural family of *Aurantiaceæ*, so called from the original Indian names, *Neemoo* and *Leemoo*, of the Lemon. Several of those described under this genus by Dr. Roxburgh have been referred to *Atalantia* and *Glycosmis*. The species still included are rather heterogeneous in nature, and will probably require further separation. As most of the family abound in essential oil, so the leaves of some of the Limonias are fragrant, and the fruit, though small, of *L. acidissima* and *crenulata* is very acid. *Limonia laureola*, referred to this genus by Dr. Wallich, in his 'Plantæ Asiat. Rar.' t. 245, is remarkable as the only plant of this family found on the tops of cold mountains. The people of the Himalayas, remarking its highly fragrant leaves, fancy that it is by feeding on them that the musk acquires its strong and peculiar flavour.

LIMOUSIN, or LIMOSIN, a province of France, now comprehended in the departments of Corrèze and Haute Vienne. Limousin comprehended an area of 3900 square miles, watered by the Vienne, one of the great tributaries of the Loire, and by the Dordogne, and its tributaries the Isle and the Vezère, all belonging to the system of the Garonne. The province was divided into two parts by the Vezère. Haut or Upper Limousin was to the north-west of that river, and had Limoges for its capital: Bas or Lower Limousin was to the south and east; its chief towns were Brives and Tulle. Limoges was the capital of the whole province. Limousin was included in the dioceses of Limoges and Tulle, the bishops of which were both suffragans of the archbishop of Bourges.

This district was antiently inhabited by the Lemovices, a Celtic people conquered with the rest of the Celts by Cæsar. In the subsequent division of Gaul into provinces, Limousin was included in Aquitania: and upon the subdivision of that province, in Aquitania Prima. It formed part of the dominions of the Visigoths till the overthrow of Alaric II. by Clovis at the battle of Vouglé, or Vouillé, in Poitou. It was subsequently under the government of the dukes of Aquitaine, or of Guienne, from whom it was taken by Pepin le Bref. It was subsequently included in the great duchy of Guienne, under which Limoges, its capital, became a vice-county. It was in a quarrel with Adémar V., viscount of Limoges, that Richard I. (Cœur de Lion), king of England and duke of Guienne, lost his life, being shot with an arrow as he was besieging the castle of Chalus in Limousin. The possession of Limousin was subsequently disputed by the kings of England, as dukes of Guienne, and the kings of France. It afterwards came by marriage into the hands of the dukes of Bretagne, and later still into those of the counts of Albret. It was inherited by Henri IV. from his mother Jeanne d'Albret, and was by him united to the French crown.

LIMOUX, a town in France, capital of an arrondissement in the department of Aude, and on the bank of the river Aude. The streets are paved and lighted, and the houses are of tolerably good appearance. The market-place is a regular square. There are two churches, four public fountains, and a public walk. The public edifice most deserving notice is the gate of La Trinité, a modern erection, near the bridge over the Aude. The population in 1831 was 6247 for the town, or 6518 for the whole commune; in 1836 it was 7105 for the commune, showing an increase in five years of nearly 600, or almost 10 per cent. The principal manufactures are of leather and woollen cloth; there are several oil-presses, and in the neighbouring district there are iron-works. The surrounding country produces good white wine. There are a high school, an agricultural society, an hospital, and a small collection of paintings, beside several government offices for judicial or fiscal purposes. The town is about 12 miles south-west from Carcassonne, the capital of the department.

The arrondissement comprehends 688 square miles, and had a population in 1831 of 72,707, in 1836 of 75,891: it is subdivided into four cantons and 150 communes.

LI'MULUS, the name for a genus of crustaceans, one of the most known of which is popularly called *The King Crab.* [XIPHOSURIANS.]

LINA'CEÆ, a small natural order of plants, related to Cistaceæ, from which it differs in having an ovary with many cells, containing one or two seeds each, several styles, a definite number of stamens, &c., and to Geraniaceæ, from which the separate styles and peculiar fruit of Linaceæ abundantly separate that order. The definition of Linaceæ may be briefly expressed thus: polypetalous, hypogynous, monadelphous exogens, with a broken-whorled calyx; a many-celled, many-styled ovary, containing one or two pendulous ovules in each cell, and a capsule splitting at the point into as many valves as there are cells. The fruit is remarkable for having each of its carpels divided into two cells by a spurious dissipiment originating inside the back, so that in reality each cell is two-seeded, although from the presence of this spurious partition it seems to be one-seeded.

But although Linaceæ approach the two orders already named in the structure of the organs of fructification, the vegetation is essentially different, the leaves being alternate, free from all trace of a volatile secretion, and destitute of stipules, and the nodes of the stem not being capable of disarticulation. The whole order contains but two genera, Linum and Radiola: the former comprehends many species, the most important of which is common flax, Linum usitatissimum, the woody tissue of whose stems is so valuable for its toughness and fineness, and whose seeds furnish linseed oil. [FLAX, where the plant is called by mistake *Linum perenne;* LINSEED OIL; LINUM.]

LINACRE, or LYNACER, THOMAS, one of the most eminent physicians of his age, descended from the Linacres of Linacre Hall, in the parish of Chesterfield in Derbyshire, was born at Canterbury about 1460. He received his first education in his native city, under William Tilly, or De Selling, and afterwards entered at Oxford, where he was chosen a fellow of All Souls College in 1484. Anxious for further improvement in learning, he accompanied De Selling into Italy, whither he was sent on an embassy to the court of Rome by King Henry VII. De Selling left him at Bologna with strong recommendations to Angelo Poliziano, then one of the best Latin scholars in Europe. Linacre removed thence to Florence, where Lorenzo de' Medici allowed him the privilege of attending the same preceptors with his own sons; and under Demetrius Chalcondylas, who had fled from Constantinople at the taking of that city by the Turks, he studied Greek. He then went to Rome, and studied medicine and natural philosophy under Hermolaus Barbarus. He applied himself particularly to the works of Aristotle and Galen, and is said to have been the first Englishman who made himself master of those writers in the original Greek. He also translated several of Galen's treatises into elegant Latin, and with Grocyn and William Latymer undertook a translation of Aristotle, which was never completed. On his return to England he was incorporated M.D. at Oxford, which degree he had taken at Padua, and gave temporary lectures in physic, and taught the Greek language at Oxford. His reputation became so high that King Henry VII. called him to court, and entrusted him with the care both of the health and education of Prince Arthur.

In the reign of Henry VIII. Linacre stood at the head of his profession, and showed his attachment to its interests by founding two lectures on physic in the university of Oxford, and one in that of Cambridge. He may also be considered the founder of the College of Physicians in London; for in 1518 he obtained letters-patent from King Henry VIII., constituting a corporate body of regularly bred physicians in London, in whom was vested the sole right of examining and admitting persons to practise within the city and seven miles round it; and also of licensing practitioners throughout the whole kingdom, except such as were graduates of Oxford or Cambridge, who by virtue of their degrees were independent of the college, except within London and its precincts. The college had likewise authority given to it to examine prescriptions and drugs in apothecaries' shops. Linacre was the first president of the new college, and at his death he bequeathed to it his house in Knight-Rider-street, in which the meetings of the members had been held. Before this time medicine had been practised without control by pretenders of all kinds, but chiefly by monks, who were licensed by the bishops; and this charter was the first measure by which the well-educated physician was afforded the least advantage, beyond that which his own character would give him, over the most ignorant empiric.

Highly as Linacre was esteemed in his profession, he became desirous to change it for that of divinity, or rather to combine the two pursuits. In 1509 we find him in possession of the rectory of Mersham, which he resigned in the latter part of the same year, and was installed into the prebend of Eaton in the church of Wells; and afterwards, in 1518, he became possessed of a prebend in the cathedral of York, where he was also for a short time precentor. He had other preferments in the church, some of which he received from Archbishop Warham, as he gratefully acknowledges in a letter to that prelate. Dr. Knight informs us that he held a prebend in St. Stephen's chapel, Westminster; and Bishop Tanner, that he had the rectory of Wigan in Lancashire. He died of the stone, after great suffering, Oct. 20, 1524, and was buried in St. Paul's cathedral, where Dr. Caius erected a monument to his memory.

In his literary character Linacre holds a high rank among the men of learning in this country. He was one of the first, in conjunction with Colet, Lily, Grocyn, and Latymer, who revived or rather introduced classical learning into England; and he conferred a benefit on his profession by translating into Latin several of the best pieces of Galen. These were, the treatises 'De Sanitate tuenda,' fol., Par. 1517; 'Methodus Medendi,' fol., Par. 1519; 'De Temperamentis,' 4to. Cambr. 1521;[*] 'De Pulsuum Usu,' 4to. Lond. 1522; 'De Naturalibus Facultatibus,' 4to. Lond. 1523; 'De Symptomatum Differentiis liber unus. Ejusdem de Symptomatum Causis liber tres,' 4to. Lond. 1524. In these versions Linacre's style was excellent.

Linacre's translation of Proclus, 'De Sphæra,' was printed in the 'Astronomi Veteres' of 1499. His translation of Paulus Ægineta, 'De Crisi et Diebus decretoriis, eorumque signis, Fragmentum,' 8vo. Bas. 1529. He also wrote a small book upon the Rudiments of Latin Grammar, in English, for the use of the Princess Mary, first printed by Pynson without date, and afterwards translated into Latin by Buchanan. But his most learned work was his treatise 'De Emendata Structura Latini Sermonis libri sex,' printed at London immediately after his death in 1524, and frequently reprinted in later years in the sixteenth century.

Of Linacre's talents as a physician no testimony remains except the high repute which he enjoyed. For the excellence of his translations from Galen it may be sufficient to quote the praise of Erasmus, who, writing to a friend, says, 'I present you with the works of Galen, now, by the help of Linacre, speaking better Latin than they ever before spoke Greek.'

There are two copies of Linacre's 'Methodus Medendi, upon vellum, in the British Museum: one a presentation copy to King Henry VIII., the other to Cardinal Wolsey; and a dedicatory letter, in manuscript, to Wolsey, precedes, *in his copy*, the dedication to Henry VIII. The Museum also contains the treatise 'De Sanitate tuenda,' upon vellum, This was Wolsey's copy, and has the cardinal's hat illuminated in the title, and a similar dedicatory letter similarly placed.

(*Biogr. Brit.*; Herbert's edit. of Ames's *Topogr. Antiq.*; Wood's *Athenæ Oxon.*, by Bliss, vol. i., col. 42; Tanner, *Bibl. Brit. Hyb.*; Chalmers's *Biogr. Dict.*)

LINCOLN. [Lincolnshire.]

LINCOLN COLLEGE, Oxford, was founded in 1427, by Richard Flemming, or Flemmynge, bishop of Lincoln, for a rector and seven fellows; it was afterwards greatly augmented by Thomas Rotherham, bishop of Lincoln, subsequently archbishop of York, and lord high chancellor of England, who added five fellowships, and gave a body of statutes to the foundation, in which he limited the election of the fellows to the old dioceses of Lincoln and York, with the exception of one to the diocese of Wells. This was in 1479. Lord Crewe, bishop of Durham, and sometime rector of this College, in 1717 made an addition to the emoluments of the rector and fellows, and in 1718 endowed twelve exhibitions of 20*l.* a year a-piece. The scholarships and exhibitions received a further augmentation at a later time, by the will of Richard Hutchins, D.D., rector from 1755 to 1781.

The present foundation consists of a rector, twelve fellows, eight scholars, twelve exhibitioners, and one bible-clerk. The total number of members upon the books on December 31, 1837, was 132. The patronage consists of the rectories of Cublington and Twyford in Bucks, of Winterborne Abbots with Winterton Stapleton in Dorsetshire, of Hadleigh and Leighs Magna in Essex, and of Waddington in Lincolnshire; with the curacies of All Saints and St. Michael's in Oxford, and of Forest Hill and Combe-Longa in Oxfordshire. The buildings of Lincoln College retain much of their original character. They consist of two quadrangles, besides six sets of rooms erected at a later period. The largest quadrangle includes the rector's lodgings, library, and hall, built in the fifteenth century; the library was originally the chapel. The smaller court was in part built about 1612 by Sir Thomas Rotherham. The present chapel, upon its south side, was built in 1631, by archbishop Williams. The windows are rich in painted glass procured by the archbishop from Italy in 1629. In 1818 the whole front of the college was repaired, and much improved in its appearance by the addition of battlements and the introduction of appropriate Gothic windows. Among the more eminent members of this college were Dr. Robert Sanderson, bishop of Lincoln, archbishop Potter, Sir William Davenant the poet, Dr. George Hickes, Sir George Wheler, Hervey, the author of the 'Meditations,' and the celebrated John Wesley. (Gutch's and Chalmers's *Colleges and Halls of Oxford*; and the *Univ. Calendar* for 1838.)

LINCOLNSHIRE, an English county bounded on the north by the æstuary of the Humber, which separates it from Yorkshire; on the north-west by the county of York; on the west by the county of Nottingham, from which it is partly separated by the Trent; on the south-west by the counties of Leicester and Rutland; on the south by Northamptonshire; on the south-east by the counties of Cambridge and Norfolk, from the last of which it is separated by the Cross Keys Wash; and on the east by the North Sea or German Ocean. Its form is irregular, having its greatest length from north to south, 75 or 76 miles, from the bank of the Humber near the town of Barton to the bank of the Welland in the neighbourhood of Market Deeping; and its greatest breadth, 51 or 52 miles, from the junction of the three counties of York, Nottingham, and Lincoln, to the sea at Saltfleet. The area is estimated at 2611 square miles; and the population, in 1831, was 317,465, giving 122 inhabitants to a square mile. In size it is the second English county, Yorkshire alone exceeding it; in population the fourteenth, being rather less populous than Essex, and rather more so than Hampshire; and in density of population inferior to all other counties except Northumberland, Cumberland, and Westmoreland. It is comprehended between 52° 39′ and 53° 45′ N. lat., and between 0° 22′ E. and 0° 57′ or 0° 58′ W. long. Lincoln, the county town, is 121 miles north by west from London in a straight line, or 134 miles by the mail-road.

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[*] This was the first book printed in England in which *Greek types* were introduced.

Coast-line.—The coast, from the Welland to the Humber, forms a tolerably regular curve convex to the sea, and is low and marshy, except about Clea Ness, near Grimsby, where the coast rises into cliffs. A belt of sand skirts the land, of varying breadth; and the forest which once occupied the fen country, where the trunks of trees are found under the soil, extended over a considerable space now covered by the sea. From the mouth of the Welland to that of the Nene the coast is so low as to require the protection of a sea-wall or bank. The present bank is more advanced toward the ocean than what is termed the old or Roman bank, so as to gain a considerable extent of land. The æstuary of the Wash is occupied for the most part by sand-banks, dry at low water. Between these banks the streams which flow into the æstuary have their channels. Two wide spaces, or pools of deeper water, between the banks, afford anchorage to vessels. The opening near the Norfolk coast is termed Lynn Well or Lynn Deeps, though in some maps the name of Lynn Deeps is given to the eastern channel of the Ouse. The opening near the Lincolnshire coast is called Boston Deeps: it forms a long narrow anchorage, sheltered to seaward by Long Sand, Dog's Head, and Outer Knock, a range of sand-banks which run parallel to the coast to Skegness, north of Wainfleet. The water in Boston Deeps is usually from three to six, but in some places seven or eight fathoms deep. The coast between Boston and Wainfleet is occupied by a line of salt-marshes. There are other salt-marshes along the æstuary of the Humber. (Arrowsmith's *Map of England;* Greenough's *Geological Map.*)

Surface and Geological Character.—A considerable part of Lincolnshire consists of alluvium, constituting a vast extent of flat or marsh land, from the border of which the subjacent strata rise and form comparatively elevated tracts. The alluvial soil occupies the whole of the coast, with the exception of the small insulated spot about Clea Ness. It skirts the bank of the Humber, and that of the Trent, as far up as Gainsborough. West of the Trent it spreads over Thorne Waste, or Thorne Level, from the midst of which rises the Isle of Axholme. This level was antiently occupied by a vast forest; the trunks of the trees are still found in great abundance beneath the present surface, rooted in the firm ground in which they grew. [Axholme, Isle of.] West of the Wash the alluvium extends inland from Wainfleet, by Spilsby, to the river Witham, up the bank of which it extends far above Lincoln. It spreads in breadth to a considerable distance (three or four miles) from each bank nearly up to Lincoln, where it is contracted to a narrow strip. Southward from the Witham the alluvium occupies half the breadth of the county, being bounded westward by a line drawn from Heckington, between Sleaford and Boston, to Uffington on the Welland, between Stamford and Deeping, and extending beyond the Welland and the Nene into Northamptonshire and Cambridgeshire. The alluvial country, from Wainfleet and Spilsby southward, forms part of the great fen country of England. The alluvium between Louth and the sea consists principally of unstratified clay mixed with sand and various marine deposits.

From Barton-upon-Humber to Burgh near Wainfleet a line of chalk downs extends, called the Wolds of Lincolnshire. These downs sink on the north and east beneath the alluvium described above. They form part of the great chalk formation which, though occasionally interrupted or covered by other beds, extends through England from Flamborough Head in Yorkshire to the coast of Dorsetshire. The length of the Lincolnshire Wolds is about forty-seven or forty-eight miles, their average breadth six or seven, their greatest breadth twelve or thirteen. The chalk is of two colours, red and white, disposed in regular strata, the red commonly undermost: in the white chalk seams of flint, two to six inches thick, frequently occur. The chalk is found extending under the alluvium in the marshes round the Wolds: water is obtained from it by boring through the superincumbent soil; and along the coast north and south of Saltfleet are natural outlets of water called provincially 'blow wells' ('flow wells' in Greenough's map), deep circular pits, which furnish a continual flow of water, and are vulgarly reputed to be unfathomable; they are presumed to communicate with the chalk. The chalk has been pierced by well-diggers 300 feet; but it is not mentioned whether the wells were sunk wholly in the chalk or through it.

The Wolds have their steepest escarpment towards the west, on which side the green-sand crops out and forms a narrow belt, skirting the chalk from Barton to Burgh. This formation is supposed to be thin. At the south point of its extension the green-sand sinks under the alluvium of the fen district. The iron-sand occupies a narrow belt of land west of the green-sand. These two formations constitute a range of hills extending from north-west, near Market Raisin, to south-east, near Spilsby, running nearly parallel to the Wolds, to which they adjoin at their north-western end, forming an inferior terrace, while in other parts they are separated from them by the valleys of the Bain and the Steeping.

Westward of the iron-sand extends a wide flat, watered toward the north by the Ancholme, and toward the south by the Witham, occupied, except where overspread by alluvium or by chalk rubble, by the Oxford or clunch clay. The district occupied by this formation is very narrow in the north, and becomes wider as it proceeds southward, until it disappears beneath the fens. Its breadth near the Humber is about three miles, east of Lincoln about fifteen miles, and between Sleaford and Spilsby twenty-five miles; but in this part it is partially covered by the marshes of the Witham. The elevation of this stratum scarcely exceeds that of the adjacent fens. It has been penetrated to the depth of nearly 500 feet, and its breadth may be probably estimated at 700.

The low district of the Oxford clay forms a large central valley separating the Wolds, with the adjacent hills, from the higher grounds formed of the oolitic strata, which extend southward through the county from the marshes which line the Humber. They are bounded on the east by a line drawn by Lincoln (where the oolites subside, forming a narrow gap of a mile or two wide, occupied by the Witham and the adjacent marshes), Sleaford, and Bourne to Uffington. This range of high land forms part of what have been termed the stonebrash hills, and separates the valleys of the Ancholme and the Lower Witham from those of the Trent and the Upper Witham: they have their steepest escarpment on the western side, which is called, south of Lincoln, Cliffe Row. This western escarpment runs southward from Lincoln to the neighbourhood of Grantham, and then westward into Leicestershire. From the Humber to Lincoln these formations occupy a very narrow strip, varying from one or two to four miles wide; between Folkingham and Grantham they extend eight or nine miles in width; and between Bourne and Ab-Kettleby in Leicestershire, twenty-five miles. The eastern side of this range of hills consists, from Barton to Lincoln, chiefly of the great oolite; and south of Lincoln of the cornbrash and great oolite, separated by a thick bed of clay. The west side is occupied by the inferior division of the oolitic formations. Several stone-quarries are opened between Sleaford and Grantham. There are one or two outlying masses of oolite about Grantham, and between Grantham and Newark, separated from the principal oolitic range by intervening valleys occupied by the subjacent strata of lias.

This last-named formation occupies nearly all the rest of the county. Commencing at the Humber, where the district occupied by it is not more than two or three miles wide, it proceeds due south to Lincoln, southward of which it pervades all the western side of the county, except one small spot extending over the border into Nottinghamshire and Leicestershire. It is conterminous on its eastern side with the oolitic formations, from beneath which it crops out. The north-western corner of the county is occupied by the new red sandstone or red marl, which extends along the banks of the Trent, and from them westward into Nottinghamshire and Yorkshire. It is covered all round the Isle of Axholme (which is composed of red marl) by the alluvium of the Thorne Level, Hatfield Chase, and the contiguous marsh-lands. Gypsum occurs plentifully in this formation in the Isle of Axholme and on the border of the Trent; and there are mineral springs containing sea-salt and other purging salts in the neighbourhood of Gainsborough.

Hydrography and Communications.—The Trent touches the border of the county nearly midway between Newark and Gainsborough, and for about fifteen or sixteen miles separates the counties of Lincoln and Nottingham; from below Gainsborough to its junction with the Yorkshire O its course of nineteen miles is almost entirely within border of Lincolnshire. This river is navigable throug that part which belongs to this county; and vessels of 150 tons can ascend to Gainsborough, where the river is crossed by a bridge. The Idle, which comes from Nottinghamshire, or rather the Bykerdike or Vicardyke, a cut from the Idle, skirts the southern boundary of the Isle of Axholme, and falls into the Trent a little below Gainsborough on the left bank. The Bykerdyke and the Idle are navigable from East Retford. The old river Torne, another affluent of the Trent, skirts the Isle of Axholme on the north-west, and cuts (not navigable), distinguished as the New river Idle and the New Torne, pass from the rivers after which they are respectively named, through Axholme Isle into the Trent.

The Ancholme rises near the village of Spridlington between Lincoln and Market Rasen, and flows north-east six or seven miles to Bishop Briggs, when it is joined by a little river Rase from near Market Rasen. Here the navigation commences, and the stream is carried in an almost direct line by an artificial cut, about twenty miles long, into the Humber, a short distance west of Barton. The old channel of the river winds much more than the navigable cut, but coincides with it in the general direction of its course. This river serves to drain the marshes through which it flows. The Ancholme carries off the drainage of the valley between the Wolds and the oolite or stonebrash hills. The streams which fall into it are all small.

The Tetney river rises from two springs, one near Normanby and the other at Thorpe-le-Mire, near the south-western escarpment of the Wolds, between Binbrook and Market Rasen; the streams from these springs unite and flow by Binbrook and Tetney into the German Ocean between Grimsby and Saltfleet. The length of the river is about twenty-two miles. The mouth has been made navigable, the Louth navigation entering the sea there.

The Ludd rises near the south-west escarpment of the chalk range. It is formed by the junction of two or three brooks which unite above Louth and flow north-east into the German Ocean by several arms, one of which enters the sea by Grainthorpe sluice between Tetney and Saltfleet, another near North Somercoats, and the third at Saltfleet. The length of the Ludd is about eighteen miles. The Louth navigation consists partly of this river and partly of an artificial cut from the village of Alvingham to the mouth of the Tetney river: the navigation is about fourteen miles long.

The Withern or Withern Eau rises near Ashby Puerorum, and flows north-east into the sea at Saltfleet, where its æstuary receives one of the arms of the Ludd: its length is about twenty-four miles. In the upper part of its course it is called the Calceby Beck. The Steeping rises near Ashby Puerorum, and flows south-east, not far from Spilsby, twenty miles into the sea. Wainfleet stands on a small feeder of this river, about three or four miles from the sea: small craft can get up to the town. This river was formerly navigable for larger vessels, but the water has been drawn off by the dykes cut for the purpose of draining the adjacent fen.

South of Wainfleet the fen district commences: and from the extensive system of draining that has been carried on, the hydrography of the county becomes very complicated. The rivers have in several places been diverted from their natural beds, and now flow in artificial channels in direct lines; and are connected with artificial cuts, which open a communication between rivers naturally unconnected. We must therefore comprehend the natural and artificial hydrography in one view, from the impossibility of drawing exactly the line of demarcation between them.

The Witham, the most important river in the county, rises near the village of Thistleton, just within the border of Rutlandshire; but almost immediately enters Lincolnshire, flowing northward to the town of Grantham, and receiving by the way several brooks. Below Grantham the river flows first north, then west, then north, and north by east to Lincoln; two or three miles of its course in this part are on the border of the county, which it separates from Nottinghamshire; the rest within the county. A few miles above Lincoln it receives, on the right bank, the little river Brant, nearly fifteen miles long, from Brandon, north of Grantham. At Lincoln the river turns eastward, and flows to the neighbourhood of Bardney Abbey, where it receives the united stream of the Langworth river and the South Beck. The principal source of this stream (the Langworth) is in the chalk hills between Market Rasen and Louth, and its whole course is about eighteen miles. From the junction of the Langworth, the Witham flows south-east to the neighbourhood of Tattershall, where it receives, on the left bank, the river Bain; and on the right bank the Sleaford river, or Kyme Eau. The Bain rises in the chalk hills at Ludford, between Market Rasen and Louth, and flows southward by Horncastle and Tattershall. Its length is about twenty-six miles: it receives the Waring, Scrivelsby, and Enderby Becks. There is a navigation eleven miles long, partly artificial, partly natural, from the Witham up to Horncastle. The Sleaford river rises near Ancaster, and flows north-east by Sleaford and South Kyme into the Witham; its course is about twenty-two miles: there is a navigable channel thirteen and a half miles long, partly natural, partly artificial, from the Witham up to Sleaford. From the junction of these streams, the Witham flows by an artificial cut to Boston, below which town it flows in its natural bed into the Wash. The whole length of the Witham may be estimated at from seventy-five to eighty miles, for about half of which it is navigable. In the upper part of its course to Beckingham, just above which it divides Nottinghamshire from Lincolnshire, its banks are diversified with rising grounds and picturesque objects. From Beckingham to Lincoln it flows in a wide sandy valley; at Lincoln it passes through a depression in the oolite or stonebrash hills; and soon after enters the fens, through which it has the rest of its course. At Lincoln it communicates with the Foss Dyke, and below that with the Horncastle and Sleaford navigation; there are also numerous cuts connected with it for the purpose of draining the fens. It is supposed that before the Conquest the Witham had a tideway navigation for large vessels up to Lincoln; but its navigation has been liable to frequent impediments, and has required much attention.

The Welland rises in Northamptonshire, and flows along the border of that county, which it divides successively from Leicestershire, Rutlandshire, and Lincolnshire. It first touches the border of Lincolnshire just above Stamford, from whence it flows to Deeping and Crowland, where what is termed the Old Welland runs northward to Spalding, while another arm called the Shire Drain proceeds along the border of the county, into the Wash at the mouth of the Nene. From Spalding the Old Welland is conveyed in a direct line by an artificial channel into the Wash. There is a navigation up to Stamford. Between that town and Deeping there is a canal by the side of the natural stream: below Deeping the natural channel is employed for about two miles; and then there is a navigable cut to Spalding. The navigation is about twenty-eight miles long from Stamford to the Wash.

The Glen rises between Grantham and Folkingham, and flows south by Corby to Barholm not far from Stamford; in this part of its course it crosses a projecting corner of the county of Rutland. Just below Barholm it receive a stream which rises near the Glen and has a course almost parallel to it. From the junction of this stream at Wilsthorpe the Glen flows north-east into the Wash at the mouth of the Welland. Its whole length is about thirty-six miles. A small rivulet which joins the Glen has been made navigable for three miles and a half, up to the town of Bourn; and below the junction of this rivulet the Glen is navigable for about twelve miles into the Welland between Spalding and the Wash.

A general account of the great fen district of England, and of the changes which it has undergone, is given elsewhere. [Bedford Level.] The limits of the Lincolnshire fens have been already given, and it is only requisite to notice some of the principal cuts and drains. The Car Dyke, which skirts the western border of the fens, commences in the Welland between Stamford and Deeping, and runs northward nearly thirty-five miles into the fens of the Witham, with the drainage of which it is connected. Some authors state that the Car Dyke runs into the Witham, but this appears not to be the case at present, though it may have originally been so. This canal is supposed to be of Roman origin: it is sixty feet wide, and has on each side a wide flat bank.

The South Forty-Foot is cut from the Glen by a circuitous course to the Witham at Boston: its length is about twenty-two miles: it receives a number of small streams flowing from the hills that form the western boundary of the fen country.

The North Forty-Foot runs ten miles from the Kyme, or Sleaford river, near its junction with the Witham, parallel to the Witham, into the South Forty-Foot, near Boston.

The West Fen Catch-water Drain, and the East Fen Catch-water Drain bound the fen district on the north side, and extend about ten and seven miles respectively; they do not immediately communicate. The Old and New Hammond Beck runs by a circuitous course from the Welland near Spalding to the South Forty-Foot near Boston. Its length is about twenty miles. The other cuts, provincially termed 'Leams,' 'Droves,' 'Drains,' 'Becks,' 'Eaus,' and 'Dykes,' are two numerous to admit of distinct notice. In the fens between the Glen and that arm of the Welland called the Shire Drain they are particularly numerous. The drainage of the northern fens is noticed elsewhere. [AXHOLME.]

Of navigable canals, beside the Ancholme, Louth, Horncastle, Sleaford, Bourn, and other navigations already noticed, there are only two. One of them, the Foss Dyke, is probably a Roman work, and appears to have been used for navigation previous to the Conquest. Henry I. had it cleaned out and the navigation improved. Some have supposed him to be the author of it. It extends from the Trent at Torksey, once a place of some consequence, above Gainsborough, to the Witham at Lincoln; its length is eleven miles; it is level throughout, but its waters are four or five feet above those of the Trent. It is supposed to have been a continuation of the Car Dyke, which, though now used only for draining, is supposed to have been formed for the purpose of navigation: but there is no need to assume any connection between the Car Dyke and the Foss Dyke, if, as is likely, the Witham was antiently navigable for ships up to Lincoln. The other canal is the Stainforth and Keadby Canal, which opens a communication between the Don or Dun navigation at Stainforth near Thorne in Yorkshire, and the Trent at Keadby in Lincolnshire. This canal, which is fifteen miles long, has a part of its course in the Isle of Axholme in Lincolnshire.

Among the projected railways the Northern and Eastern was designed to pass through this county. It was to run from London by Cambridge to York. It was to enter Lincolnshire a little to the east of Market Deeping, and was designed to run nearly parallel to the present coach-road to Lincoln; and from thence first on the left, then on the right of the Foss Dyke to the Trent above Gainsborough. The execution of this railroad, except of the part from London to Cambridge, has been given up for the present,

The principal coach-road is the Hull, Barton, and Lincoln mail-road. This enters the county at Market Deeping, 90 miles from London, and runs north by west by Bourne (97 miles), Folkingham (106 miles), and Sleaford (115½ miles) to Lincoln (134 miles). From Lincoln the road runs due north in a direct line along an old Roman road for many miles: and then turning north by east, runs by Brigg, or Glanford Bridge (156 miles) to Barton (167 miles), on the south bank of the Humber, opposite Hull. The Louth and Boston mail-road branches off from the above just before it enters Lincolnshire, and passing through the opposite extremity of the town of Deeping, runs by Spalding (101 miles), Boston (116½ miles), and Spilsby (133½ miles), to Louth (145 miles): from whence a road runs onward to Great Grimsby (165 miles) on the Sea. The great north road (travelled by the Thurso, Edinburgh, and York mail, and by the Glasgow and Carlisle mail) enters the county at Stamford (89 miles), and runs north-north-west by Grantham (110 miles) into Nottinghamshire. Roads lead from Lincoln by Wragby to Louth, and on to Saltfleet; by Market Rasen to Grimsby; and by Newark to Nottingham. A road from Nottingham by Bingham falls into the high north road at Grantham; and a road from Yarmouth and Norwich, by Lynn and Wisbeach, falls into the Louth and Boston road at Spalding. The other roads do not require specific notice.

Agriculture.—The agriculture of Lincolnshire is interesting on many accounts. The soil varies greatly in different districts. In some places it is as rich and productive as the greediest farmer could desire, and in others so poor as to weary the patience and industry of the most persevering. The grazing land in this county cannot be surpassed in its capabilities for fattening cattle; and some of the drained fens and warp lands along the rivers possess a high degree of fertility when cultivated. From these circumstances it follows that every variety of cultivation which this island presents may be observed in this county. There are still some lands which are under the old course of two crops and a fallow, while others are cultivated with all the care which an improved system of husbandry recommends.

To give a general idea of the various kinds of soil, we will follow the division given by A. Young in his Report of this county; premising however that it cannot be considered as entirely correct, but only an approximation to the truth.

	Acres.
He reckons of fen lands	776,960
Of loamy and sandy heaths, now mostly cultivated	118,400
Of wolds, chiefly chalk	234,880
Of various loams and sands of moderate quality	718,080
Making a total of . . .	1,848,320

Upon the whole the majority of the lands in Lincolnshire may be said to possess a soil of more than medium fertility, compared with the average of Great Britain, and the produce of the county, both in grain and cattle, is very considerable.

The temperature of Lincolnshire is nearly the same as that of the centre of England. The flatness of the surface allows the winds to blow uninterruptedly over it, and of these the western are the most violent. Near the coast the sea tempers the cold easterly winds in winter, and the snow seldom lies long.

The climate in the lower parts, where, in spite of extensive drainings, much marshy ground still remains, is not very healthy, and intermittent fevers are prevalent; but they are becoming much less frequent since the draining and improvement of the soil. The water in the lower parts is bad and brackish, being procured only from wells and ponds; there is no such thing as a spring of pure water in the fens. The lands which have been reclaimed from the sea by banking and draining are mostly laid in large farms, which require a considerable capital. In other parts of the county there are many small properties, cultivated by the owners, and kept with great neatness. There were formerly many more of these than there are now. Lincolnshire exhibits great neatness in the care with which the land is weeded and manured, especially the light sands. The introduction of bones for manure has made many poor light sands in Lincolnshire vie with the best in production, and nowhere have ground bones been used so long and so abundantly. The turnips, which are raised by means of this manure on the poorest sands, being fed off with sheep, lay the foundation of a productive course without any other manure.

Among the different manures which are used for the arable land in Lincolnshire, we must not pass over that of fish, especially that small fish which abounds in shallow waters, and is named the stickleback. It is very soon putrid, and greatly assists the natural juices of the earth in producing vegetation.

On the richest fen lands the most profitable rotation consists of the following crops:—1. Cole, fed off with sheep; 2, oats; 3, beans; 4, wheat; 5, clover; 6, wheat. If wheat were sown immediately after the cole, it would be rank, and probably lodged. The oats and beans reduce it to a proper state, by exhausting a portion of the manure and preparing the soil better for wheat. The oats are always fine and abundant, seldom less than 8 quarters per acre, and often 10 and even 12 quarters.

In some heavy soils the Essex rotation is adopted:—1, fallow; 2, barley; 3, beans; 4, wheat; and this, alternated with the other, answers well on rich lands. A fallow once in ten years is almost indispensable, to keep the land free from root-weeds. The clover also recurs less often, and is consequently less apt to fail than when it is sown every sixth year on the same land. Those who have been induced by some eminent agricultural writers, such as Arthur Young, and others, to attempt to cultivate heavy and wet soils without an occasional fallow, have soon been obliged to return to this effective mode of cleaning land: the hoeing of beans or other green crops can never be executed so perfectly as to keep the land entirely free from those destructive weeds which have perennial roots. For the poor sands there is no system so advantageous as that of raising turnips, and feeding sheep with them on the land where they grow. The tread and urine of the sheep give consistency to the loose sand, and, for a time, impart to it the properties of a good loam, so that it will retain water sufficiently to supply the roots of the growing corn. If marl can be put on the surface at the same time, the nature of the soil will be greatly improved; and that which would only bear a crop of oats, will now become capable of giving a good return of wheat. Manure alone cannot effect this;

it would only cause the wheat to run to straw and lodge, and give no grain. To manure poor lands highly, without first consolidating them, is absolute loss of both dung and labour.

From the returns of forty different farms, A. Young has given the average produce in Lincolnshire as follows:—

Wheat—seed, 3 bushels; average crop, 3½ quarters. Barley—seed, 3¾ bushels; average crop, 4½ quarters. Oats—seed, 6 bushels; average crop, 6½ quarters. Beans—seed, 3¾ bushels; average crop, 3¾ quarters.

It is probable that the general adoption of the drill in sowing, and the improvement of the cultivation since the report of A. Young, have increased the proportion of the crop compared with the seed about one-eighth.

The crops usually raised on the arable land are mostly the same as in other counties on similar soils. There is some woad cultivated in the neighbourhood of Boston on rich warp land; some sainfoin grown on the chalky soils, and lucern on the richer; but not to the extent to which this useful plant ought to be cultivated as green food for horses and cattle. Cabbages and carrots are cultivated to a considerable extent; the former on the heavy clays, and the latter on the light and deep sands.

The grass-lands of Lincolnshire and of the neighbouring county of Leicester are some of the best feeding lands in the kingdom. The average number of beasts of a moderate size, about 70 or 80 stone of 14 lb., which can be kept on an acre, taken from twenty-six places, is stated by A. Young to be as follows:—sheep in summer, per acre, 3¾; sheep in winter, per acre, 2; acres to feed a bullock in summer with the sheep, 1¾. So that 1¾ acres of grass-land will feed—in summer, 1 bullock and about 6½ sheep; and in winter, 3½ sheep, which is a high average: some of these lands will feed a bullock and 6 sheep per acre all the summer.

Some of the finest pastures are fed off by horses which are fatted for the markets; but horses soon deteriorate the grass, while sheep improve it.

Graziers are not fond of mowing grass for hay. It renders the pasture coarse, and the hay is not of so rich a quality as might be expected, owing, probably, to a want of care in making it. Grass-land is occasionally broken up to grow woad or flax on it. When this is done very judiciously, it may be laid down with grass seeds and soon be good pasture again: but, in general, it is a long time before the newly-sown herbage is so fattening as the old grass. When grass-land is broken up it gives such rich crops, that the temptation to overcrop it is too strong to be resisted; and once exhausted to a certain degree, it cannot be restored to its richness for a long time. When arable land is laid down to permanent grass in a rich, clean, and unexhausted state, the success is invariable; but it is often done without attention, and a failure is the consequence.

One of the most effectual improvements on land, by the side of some rivers in which the tide flows rapidly, is that of warping; or, in other words, retaining the water on the land so long as to let it deposit a layer of sand and mud. Thus a new soil is created over an old one; and this deposited soil is always very fertile. Such is the benefit produced by warping, that expensive works have been raised for the purpose, and extensive tracts of poor land have been covered in a short time with a new soil of the finest quality, as the crops raised upon it will clearly show.

The warping is effected by letting in the water of the rivers, which have a muddy current, by artificial channels and sluices, and retaining it there till low water. The river Humber carries off, in its course over various soils, all the finer particles which are too light to be immediately deposited. These consist of every kind of earth and portions of vegetable and animal matter. The tides, which are continually changing the direction of the current, keep this earth in suspension by the agitation which is produced; and when the water charged with earth is let in on the low grounds by the side of the river by means of canals and sluices, the earth is soon deposited and forms a coat of mud of a highly fertile nature. Such is the quantity of earth contained in the water, that a layer one-tenth of an inch in thickness is often deposited between one tide and the next. Thus in a very short time a new soil is formed of any depth which may be desired, provided the land lies below the level of the river at high tides.

Besides creating a soil, the warping fills up all inequalities, and a perfectly level surface is produced. Warp land possesses a natural power of production, which cultivation and manuring cannot imitate. The basis of the soil is fine clay and sand, the latter minutely divided and intimately mixed with the former, with a considerable portion of fine calcareous earth. Very little vegetable matter can be extracted by analysis, but there is no doubt a very considerable portion of it in an insoluble state, probably combined with lime or argilla. Sufficient experiments have not yet been made to show this combination, as likewise the galvanic effects of the intimate mixture of the different earths. It is to be hoped that the attention of agricultural chemists will be turned to this subject. Considerable light may thus be thrown on the causes of fertility in soils.

The atmospheric air seems to act powerfully on the newly deposited warp; for before a fresh layer is deposited, which is within twelve hours, such an alteration has already taken place on the surface, that the new deposit does not unite in one mass with the last, but a regular stratification can be observed, which shows the quantity deposited in each tide. The new warp also requires to be stirred and exposed to the air for some time before it acquires its great fertility. It is therefore probable that the insoluble vegetable earth requires to be oxygenated and rendered soluble. The richest crops of beans, wheat, oats, and rape are raised without manure on the warp lands. It is not so well adapted for barley or turnips on account of its slimy nature.

It has added much to the produce of Lincolnshire, that the crops raised on the warp lands have enabled the farmer to employ all the manure made by the abundance of straw which these lands produce to improve the lands that lie above the reach of the waters. As long as the level of the warp lands allows a fresh addition of warp, this system is highly advantageous; but as soon as the surface rises to high-water mark, this system must cease, or the warp lands will be exhausted in time, like the Dutch and Flemish *polders*, and require manure like other lands. The best mode of treating warp lands which are too high to admit of being warped over again is to lay them down to grass in a state of great fertility. The pasture upon them will soon equal the best old grass, carrying a bullock per acre, besides several sheep during the whole of the summer.

In a county which contains so rich pastures it is of great importance that the breed of cattle and sheep be of the most profitable kind; accordingly we find that no county possesses finer breeds of horses, oxen, and sheep. The Lincolnshire horses are celebrated for their size and power. Horncastle fair is the great resort of all the London dealers, who purchase hunters and carriage-horses at very high prices. The horses which are bred in the fens are apt to have rather too flat and broad feet, from the softness of the pastures there. This is a great defect when they are intended for speed on hard roads; but for farm purposes they answer as well as those bred on drier soils. The best hunters are bred on the higher and drier lands; but they are generally turned out for a time in the richer pastures to give them flesh before they are sold.

The oxen which are preferred for grazing are the short-horns, and some crosses of long-horns. Mr. Collins's Durham breed has been introduced and kept up with considerable success. Some rich proprietors and farmers are very careful in maintaining the reputation of their stock; and fine bulls are reared without regard to expense, which is well repaid by the superiority of their produce. The most judicious graziers are of opinion that middle-sized oxen are more profitable for grazing than the larger: an ox of about 80 stones of 14 lb. is thought to fatten more rapidly in proportion than either larger or smaller, provided the breed be good.

There are not many dairies in Lincolnshire: breeding and fatting are considered more profitable and less troublesome. There is however some excellent cheese made of the Stilton kind. A. Young mentions Mr. Grundy, of Heath Hall, near Grantham, as an eminent cheese-maker. A descendant of his is now residing at Old Windsor, in Berkshire, where he makes the famous Forest cheese, which still goes by the name of Grundy cheese, and is the best cheese of the Stilton kind made in England. He was brought from Lincolnshire by George IV., and established in a royal dairy in Windsor Forest. The sheep which are bred in this county are principally of the long-woolled, commonly called Leicesters. But the two counties differ only in the great proportion of fen lands to be found in Lincolnshire. The rich upland pastures are similar in both counties. The old Lincoln sheep are larger than the improved Leicester and carry a heavier fleece; they are also hardier; the latter however are generally preferred, from their greater propensity to fatten. A cross has been produced which partakes of the qualities of both breeds, and is preferred by some for the fens.

There is nothing particular in the breed of pigs, except that it has been much improved of late years by crossing with improved breeds.

The principal fairs in Lincolnshire are:—Alford, Whit-Tuesday, November 8; Barton-upon-Humber, Trinity Thursday; Belton, September 25; Boston, May 4, August 5, November 18, and lasts four days, December 11; Bourne, March 7, May 6, October 29; Brigg, August 5; Burgh, May 13, October 2; Burwell, Old Michaelmas-day; Caistor, Friday and Saturday before Palm Sunday, Friday and Saturday before Whit-Sunday, Friday and Saturday after Old Michaelmas-day; Caythorp, Good Friday; Corby, August 26, Monday before October 11; Coulthorpe, April 29; Crowle, last Monday in May, November 22; Donnington, May 26, August 17, September 4, October 17; Epworth, first Tuesday after May 1; first Thursday after September 29; Falkingham, Ash Wednesday, Palm Monday, May 13, June 16, July 3, Thursday after Old Michaelmas-day, November 10 and 22; Gainsborough, Easter Wednesday, October 20, if it falls on a Wednesday, then the Wednesday after; Grantham, Easter Eve, Holy Thursday, July 10, December 17; Heckington, Thursday before October 10; Holbeach, May 17, second Tuesday in September; Horncastle, June 19-22, August 11-21, October 26-29; Kirton-Lindsey, July 18, December 21; Lincoln, Tuesday to Friday in the last whole week in April, July 5, first Wednesday, Thursday, and Friday after September 12, November 28; Louth, third Monday after Easter Monday, November 23; Market Deeping, second Wednesday after May 11, October 10, November 22; Market Rasen, September 25; Nevenby, August 18, October 17; Partney, August 1 and 25, September 18 and 19, October 18 and 19; Sleaford, Plough Monday, Easter Monday, Whit-Monday, August 1, October 20; Spalding, April 27, June 29, August 26, September 25, Wednesday before December 6; Spilsby, Monday before Whit-Monday, Monday after ditto, Monday fortnight after Whit-Monday if it fall in May (if not, there is no fair), first Monday in July, old style; Stamford, Tuesday before February 13, Monday before Midlent, Midlent Monday, Monday before May 12, Monday after Corpus Christi, August 5, November 9; Stow Green near Sleaford, July 4; Swineshead, first Tuesday in June, October 2; Tattershall, May 15, September 25; Wainfleet, third Tuesday in May, July 6, August 24, October 24; Wintringham, July 14; Wragby, Holy Thursday, September 29.

Divisions, Towns, &c. — Lincolnshire has long been divided into three 'parts,' as they are termed, Lindsey, Kesteven, and Holland. Lindsey, which is mentioned by Bede under the name Lindesse, and in the Saxon Chronicle by the names Lindissi, Lindesse, and Lindesige, is by far the largest, and comprehends all that part of the county which lies north-east of a line drawn from Clifton-upon-Trent, partly along the Foss Dyke, to Lincoln (which city, with a small territory to the south-east, is included in it), thence by the Witham to near Boston, and from just above that town north-eastward to the sea between Boston and Wainfleet. The name Lindsey, like that of the county, is derived from Lindum, the Roman name of Lincoln. From the name, with the subjoined epithet Colonia, came Lincoln,* and thence Lincolnshire; and from the name without the epithet, Lind-sey. The latter part of this name appears to be the Saxon 'ey,' an island; 'the Isle of Lindum,' a name sufficiently descriptive of the district, which is insulated by the sea, the Humber, and the Trent, the Foss Dyke and the Witham, with their connected marshes.

Kesteven comprehends the south-western part of the county; it extends on the north and north-east to the Foss Dyke and the Witham, except just about Lincoln, where Lindsey encroaches upon these boundaries. It is bounded eastward by a line drawn south from the Witham, at the junction of the Kyme, or Sleaford river, to the Welland, between Deeping and Croyland. The origin of this name is very obscure.

Holland, called by Ingulphus Hoilandea, comprehends the rest of the county, including the greater part of the fens. The name appears to be derived from the Saxon Hol, 'a hole or hollow,' a name not inappropriate to the fen district, forming, as it does, a vast basin in the midst of surrounding higher ground; or perhaps from Holh, 'a ditch, (another form of the same word), an epithet equally appropriate.

These divisions are of great antiquity; they are also characterized by distinct natural features. The insular character of Lindsey has been noticed; the Wolds, or chalk hills, form the nucleus of it. Kesteven is distinguished by the steep slope of the Cliffe Row, which overlooks the valley of the Witham; and Holland, like its continental namesake, is distinguished by its fens.

Lincolnshire is further divided into wapentakes, hundreds, and sokes. These, with their situation in the county, their chief town, area, and population in 1831, are as follows:—

			Acres.	Pop. 1831.
I. Parts of Lindsey.				
Aslacoe, wapentake	Central	(no town)	43,240	4,839
Bolingbroke, soke	Central	Spilsby	59,980	11,119
Bradley Haverstoe, wapentake	N.E.	Grimsby	66,450	11,919
Calceworth, hundred	E.	Alford	58,670	10,266
Candleshoe, wapentake	E.	Wainfleet	52,040	8,516
Corringham, wapentake	N.W.	Gainsboro'	46,250	13,183
Gartree, wapentake	Central	Tattershall	54,050	6,963
Hill, hundred	Central	(no town)	24,980	3,420
Horncastle, soke	Central	Horncastle	24,780	8,656
Lawress, wapentake	E.	(no town)	46,570	7,243
Louth Eske, hundred	N.E.	Louth	70,190	14,027
Ludborough, wapentake	N.E.	(no town)	12,610	1,430
Manley, wapentake	N.	Epworth	131,560	23,046
Walshcroft, wapentake	Central	Market-Rasen	57,230	7,615
Well, wapentake	E.	(no town)	19,540	3,194
Wraggoe, wapentake	Central	Wragby	58,900	6,322
Yarborough, wapentake	N.	Barton	117,370	19,487
Lincoln, city and liberty	Central		17,560	11,843
Total of parts of Lindsey			961,970	173,088
II. Parts of Kesteven.				
Aswardhurn, wapentake	Central	(no town)	45,280	6,407
Aveland, wapentake	S.	Bourn	53,220	9,978
Beltisloe, wapentake	S.	Corby	53,470	6,430
Boothby Graffo, wapen.	W.	(no town)	56,250	7,843
Flaxwell, wapentake	Central	Sleaford	37,420	6,015
Langoe, wapentake	Central	(no town)	54,070	7,556
Loveden, wapentake	W.	(no town)	47,340	7,965
Ness, wapentake	S.	Stamford	31,650	12,707
Winnibriggs and Threo, wapentake	S.W.	(no town)	41,460	6,149
Grantham, borough and soke	S.W.	Grantham	25,400	10,780
Total of the parts of Kesteven			445,560	81,830
III. Parts of Holland.				
Elloe, wapentake	S.	Spalding	148,560	29,314
Kirton, wapentake	S.E.	Swineshead	71,660	14,777
Skirbeck, wapentake	S.E.	Boston	36,100	18,456
Total of the parts of Holland			256,320	62,547
Total of the county .			1,663,850	317,465

The county contains the city of Lincoln, the boroughs and market-towns of Boston, Grantham, Grimsby, and Stamford; and the market-towns of Alford, Barton-upon-Humber, Bolingbroke, Bourne, Caistor, Corby, Crowle, Deeping, Donington, Epworth, Falkingham or Folkingham, Gainsborough, Glanford Bridge or Brigg, Holbeach, Horncastle, Kirton, Louth, Market Rasen, Sleaford, Spalding, Spilsby, Swineshead, Tattershall, Wainfleet, and Wragby. To these may be added the now disused market-towns of Binbrook, Burton-upon-Stather, Crowland or Croyland, Navenby, and Saltfleet. Of some of these an account is given elsewhere. [Axholme; Barton-upon-Humber; Boston; Gainsborough; Grantham; Stamford.]

Lincoln is on the north bank of the Witham, just at the place where it passes through an opening in the stonebrash hills, 134 miles from London, through Ware, Biggleswade, and Peterborough. It was a place of considerable importance under the Romans. In the time of the Saxons it was also a place of consequence; and notice of it occurs in the struggles of the Saxons and Danes. At the time of the Conquest it was one of the most important places in the kingdom, and the emporium of a considerable trade. William the Conqueror ordered the erection of a strong castle here A.D. 1086. The erection of this castle is said to have caused the demolition of two hundred and forty houses. At the time of the Domesday survey there were in Lincoln 1070 houses and 900 burgesses. The prosperity of the place appears to have been further promoted in the time of Henry I. by clearing out the Foss Dyke, and making it again available for navigation. This inland communication, with the advantage of the navigation (probably a tideway navigation for sea-borne vessels) of the Witham, rendered the situation of Lincoln peculiarly favourable for commerce. In the reign of Stephen the empress Maud was besieged here by the king, who took the city, but the empress escaped. The castle was shortly after surprised by some of her partisans, and being besieged by the king, who had the townsmen in his interest (A.D. 1141), was relieved by the approach of Robert earl of Gloucester, natural brother to the empress. Stephen, upon the approach of the relieving force, gave battle to it; but, by the desertion of Alan earl of Richmond, he was defeated and taken after fighting with the greatest intrepidity.

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* Variously written by the Saxons, Lincol, Lincolla, Lincolne, Lindcylne (all in 'Sax. Chron.'), Lindcolene (Bede), Lyndcollan, Lyndcylene, and Lincylne

In the civil wars of the reign of John the town was taken by Gilbert de Gaunt, one of the barons in the interest of Louis, Dauphin of France, who had created him earl of Lincoln. The castle however held out for the king and was besieged by Gilbert, who hearing that John was approaching from Norfolk, retreated from the place. John however having lost his baggage in the Wash, and died of grief, Gilbert retook the town and reinvested the castle. The earl of Pembroke, regent during the minority of Henry III., advanced to relieve it, and Fulk de Brent, a chieftain of the king's party, threw himself with a reinforcement into the castle. The besiegers, who were supported by a body of French, were attacked on both sides; and the town, in which they attempted to defend themselves, was stormed by the earl of Pembroke. The count of Perche, commander of the French, was slain; many of the insurgent barons and other prisoners of rank were taken, and the party of the Dauphin was crushed. The battle was fought June 4, 1218. At a subsequent period the castle was in the hands of John of Gaunt, son of Edward III., who greatly improved it.

In the civil war of Charles I. the inhabitants promised to support the king, but in A.D. 1643 the city was in the hands of the parliamentatians, who had a garrison here. The royalists attempted by treachery to possess themselves of the place; but the plot was discovered, and the cavaliers who had broken in were repulsed. They got possession of the city however soon after; and in 1644 the parliamentary army under the earl of Manchester attacked the city and took the lower part of it. The royalists retreated to the cathedral and the castle, which were stormed, in spite of a gallant resistance, on the night of May 5th, two days after the earl's arrival before the place.

The city is built on the southern slope and at the foot of a hill, on the summit of which is the cathedral. It contains twelve parishes, and part of a thirteenth, the remainder of which, with two others, are locally within the limits, though not in the jurisdiction of the city. There are four parishes in the liberty of the city, on the opposite side of the river: the area of the city cannot be given separately: the city and liberty, and the included parishes, contain altogether 17,560 acres. The town is irregularly laid out; the principal street is along the road from London to Barton-on-Humber, which extends right through the place, crossing the Witham by a bridge, and running up the hill on which the cathedral stands. This street also extends a considerable length south of the Witham. The streets are paved, lighted with gas, and supplied with water from public conduits or fountains. There are several small bridges over the Witham or over the drains or dykes near the city. The high bridge over the Witham has one arch of nearly 22 feet span, and 11 feet high; it is considered to be at least five hundred years old. There are market-places or market-houses for corn, cattle, meat, and butter, in different parts of the city; the fish-market is held near the high bridge.

The most interesting of the public buildings is the cathedral, which is advantageously situated on the summit of the hill, and may be seen for many miles across the flat country to the south-east or south-west: its three towers have at a distance a very fine effect. It has been erected at different periods, and combines, in consequence, various styles of architecture: the predominant style is the early English, of a remarkably rich and beautiful character. The cathedral may vie with any, and has been by some judges preferred even to York. It is much enclosed by buildings on the north, south, and west sides; but is more open on the east. The nave is very fine, and the piers in this part are peculiarly rich; and though the side aisles are unusually narrow, the effect of the whole is excellent. The western front, which embraces the width of the nave and aisles with the side chapels (or, as some term them, transepts) at the west end, is partly Norman, partly early English: it has two towers whose height from the ground is 180 feet. There were formerly spires upon these, of the height of 101 feet, but these were taken down thirty years ago; there are still pinnacles at the corners of the towers. At each angle of the west front are octagonal staircase turrets crowned with pinnacles. There are three west doorways, the centre one opening into the nave, the side ones into the two side aisles. There is much sculpture and tracery on this front in excellent preservation; and over the central doorway are several statues of the kings of England, from the Conquest to Edward III., under decorated canopies. The central or great transepts are chiefly in the early English style; they have aisles on the eastern side, which are divided into rooms, used as vestries or chapels. There are at the ends of the transepts circular windows; that at the end of the south transept is one of the finest circles in the early English style remaining. The 'Galilee court,' or porch attached to the west side of the south transept, and the chapels on the east aisle of the same, are particularly deserving of attention for the intricacy and beauty of their mouldings, and the singularity and excellence of their general composition. At the intersection of these transepts with the nave and choir is the central tower, 53 feet square, with pinnacles at the corners. The windows of this tower are rather small, which circumstance renders the lantern obscure. The height of this tower from the ground to the summit of the pinnacles is about 300 feet. The choir is of richer and more elaborate composition than the nave and transepts; though, like them, it is of early English character. It is separated from the nave by a rich stone screen.

The eastern end of the choir, with the Lady Chapel, is of a transition style between the early and decorated English, of peculiar beauty and interest. The east window, of eight lights, is a fine composition. The cathedral is at this end less encompassed with buildings; a better view of it can consequently be obtained. There are two transepts to the eastward of the principal transepts, and there are several chapels in different parts. The dimensions of the cathedral are as follows:—Exterior length of the church within its buttresses 524 feet; interior length 482 feet; width of the cathedral (interior width, we believe, of the nave and choir with their respective aisles) 80 feet; height of the vaulting of the nave 80 feet; width of the western front 174 feet. Exterior length of the principal transept 250 feet, interior 222 feet; width 66 feet. Smaller or eastern transept—length 170 feet; width, including the side chapels, 44 feet. The dimensions are, we believe, when not otherwise specified, interior dimensions.

The old bell, called the Tom of Lincoln, which was cast in 1610, and hung in the northernmost of the west towers, became cracked in 1827, and being broken up in 1834, with six other bells, was recast into the present large bell and two quarter bells by Mr. Thomas Mears of London, and placed in the Rood (or central) tower in 1835. The new bell, which is larger and heavier than the old one, is 6 feet 10¼ inches in diameter at the mouth, and weighs 5 tons 8 cwt.: the old one weighed nearly a ton less, viz. 4 tons 14 cwt. The new bell is more musical than the old one, but not nearly so loud and sonorous. It is the third bell for size in the kingdom; being exceeded only by 'Mighty Tom' of Oxford (7 tons 15 cwt.) and 'Great Tom' of Exeter (6 tons).

On the north side of the cathedral are the cloisters with the chapter-house. The cloisters enclose a quadrangle of 118 feet by 91: three sides remain in their original state, and are of good decorated work; over the fourth (the north) side is a library built by Dean Honeywood in the latter part of the seventeenth century. The library contains a collection of books, with some curious specimens of Roman antiquities. In the enclosure of the cloisters, some feet below the surface, is a handsome tessellated pavement.

From the eastern side of the cloisters is the entrance to the chapter-house, a lofty and elegant decagon, with a groined roof supported by a central pillar. Though not equal to the chapter-house of Salisbury, it is very fine. Its interior diameter is 60 feet 6 inches.

The cathedral contains numerous monuments; but many more, which formerly existed, have been removed or totally destroyed. Many were defaced or pulled down at the Reformation, or by the parliamentary soldiers in the great civil war; and many were disarranged when the floor of the cathedral was newly paved in A.D. 1783, or when subsequent alterations were made in the nave and choir. Among other tombs are those of Catherine Swinford, duchess of Lancaster, wife of John of Gaunt; of Joan, countess of Westmoreland, their daughter; and of several bishops and deans of the cathedral.

The officers of the cathedral are the bishop, dean, precentor, chancellor, subdean, six archdeacons, fifty-two prebendaries, four priest-vicars, five lay-clerks or singing-men, an organist, seven poor clerks, four choristers, and six burghist chanters. The net yearly revenue of the bishopric is 4542*l.*; the net yearly income of the cathedral, divided between the dean, precentor, chancellor, and subdean, is 6986*l.*; these dignitaries have residences. On the south side of the cathedral are the ruins of the bishop's palace, which was demolished during the civil wars. The shell of the magnificent hall, eighty-four feet by fifty feet, supported by two rows of pillars, a gateway, and part of the kitchen wall, remain. A modern house has been built on part of the site, in which the bishop resides when at Lincoln. The deanery is an antient building; and near it is another antient building, called 'the Works Chantry,' formerly the residence of the chancellor of the diocese. The vicar's college once formed a quadrangle, of which at present there remain only four houses inhabited by the vicars. There is an antient gateway yet standing.

The see of Lincoln was originally at Dorchester on the bank of the Thames. The see of Dorchester is said to have been founded A.D. 625 or 636. The dioceses of Leicester and Sidnacester (probably Stow, between Lincoln and Gainsborough), the latter of which comprehended the parts of Lindsey, were added to it; and in the eleventh century (A.D. 1057, or 1072, or 1088, for accounts vary) the seat of the bishopric was removed to Lincoln. Although the dioceses of Ely (in the twelfth century), Oxford and Peterborough (in the sixteenth century,, at the Reformation), were taken out of it, it is still the most extensive diocese in the kingdom. It is divided into six archdeaconries: 1, Lincoln; and, 2, Stow, which two comprehend the county of Lincoln; 3, Leicester, which includes Leicestershire; 4, Bedford, which includes Bedfordshire; 5, Huntingdon, which includes Huntingdonshire and part of Hertfordshire; and, 6, Buckingham, which includes Buckinghamshire. Considerable alterations are however to be made, in conformity with the act 6 and 7 Will. IV., c. 77. The counties of Huntingdon and Bedford are to be transferred to the diocese of Ely; the county of Buckingham is to be transferred to the diocese of Oxford; the county of Leicester to the diocese of Peterborough; and the part of Hertfordshire to that of Rochester. Of the present diocese only the county of Lincoln is to remain, but to this is to be added the county of Nottingham, transferred from the diocese of York. A fit residence is to be erected for the bishop, whose average income is to be from 4000*l.* to 5000*l.*

The parish churches of Lincoln are twelve in number; formerly there are said to have been fifty or more, most of which were standing at the time of the Reformation. The present churches are mostly small and much mutilated. Four of five churches south of the Witham have Norman towers. An additional church is about to be built by subscription.

The remains of the castle stand on the hill, west of the cathedral: they consist chiefly of the outer walls and the gateway tower. The site of the castle is occupied by the county gaol and court-house, which were rebuilt a few years ago in a handsome style by Sir R. Smirke. In one corner of the area is a small building, 'Cob's Hall,' supposed to have been a chapel; and in one part of the outer wall, on the north side, are the remains of a turret in the line of the Roman wall of Lindum, in which is a gateway apparently Roman, and supposed to have been one of the gates of that station, or to have belonged to a building more antient than the castle.

Lincoln abounds in monastic and other remains of antient architecture. There are several antient gateways, as the Chequer or Exchequer Gate in the Cathedral Close, and the Stonebow in the High-street: the remains of a fort called 'Lucy Tower;' a tower of three stories, incorporated in a modern house called 'the Priory,' and several other buildings. 'The Grey Friars' is a large oblong building, the lower story of which is occupied as a spinning-school, and lies some feet below the surface of the ground; part of the upper story, formerly the chapel, is now used for a free-school, and the remaining part as a library. The remains of John of Gaunt's Palace and of a building called John of Gaunt's Stables present some interesting Norman and early English features. In the gable of the palace is a beautiful oriel window.

The population of the city and liberty, in 1831, was 11,843, to which may be added that of the three parishes locally included, 1360: together, 13,203. The chief trade is in flour, which is sent to Manchester and London, and there are some extensive breweries noted for their ale. There are now eight or ten steam engines in the city: a few years ago there was not one. The county assizes and the election for the northern division of the county, and quarter-sessions for the city and liberty, are held here. There are a race-course, a theatre, and assembly-rooms.

There are several dissenting places of worship, several public libraries, two news-rooms, a flourishing mechanics' institute, and several book-societies. There are a general dispensary, a lunatic asylum, a county hospital, a lying-in-hospital, and several other charitable institutions.

Lincoln was incorporated by charter of Henry II., but the governing charter was that of Charles I. By the Municipal Reform Act the city is divided into three wards, and has a mayor, six aldermen, and eighteen councillors. The guildhall is an antient Gothic building; the court-house for the city is modern; the gaol is not large enough to admit of the proper classification of prisoners.

The city returns two members to parliament: it first exercised this privilege in the reign of Henry III. The parliamentary constituency, in 1833, consisted of 603 freemen and 521 ten-pound householders: total, 1124. The parliamentary borough comprehends the city and a small portion of the liberty.

There were in the city, in 1833, two infant-schools, with 323 children; five dame-schools, with 67 children; thirty-two day-schools (including two endowed schools, with 86 children), with 776 children; four boarding and day schools, with 150 to 180 children; one national school, with 474 children; and seven Sunday-schools, with about 700 children. There were at the same time in the liberty, one boarding-school, with 30 to 40 children; six day-schools (three of them partly or wholly supported by subscription), containing 246 children; and five Sunday-schools, with 320 children.

Grimsby is in the wapentake of Bradley Haverstoe, in the parts of Lindsey, on the south bank of the Humber, near its mouth. In the time of Edward III. Grimsby was of sufficient importance to furnish the king with eleven vessels and 170 mariners for his armament against Calais. The gradual blocking up of the harbour by the accumulation of mud and sand led to the decay of the port, until it was renovated by the spirited exertions of some of the neighbouring landed proprietors about the beginning of the present century. The landing at low water is however still very bad, and a jetty is now erecting to remedy this inconvenience. The parish of Grimsby, the township of Clee, and the hamlet of Weelsby, comprehend 2110 acres, and had in 1831 a population of 4225, of which a small proportion is agricultural. The town consists of two parts: the older part of the town is irregularly laid out, and is at the head of the harbour, about a mile from the sea; the new part, commonly called 'the Marsh,' consists of three streets parallel to the harbour, on the east side. The harbour, which is a tide-harbour, with a lock, &c., is at one of the mouths of the Laceby Beck, extending inland about a mile southward from the sea: vessels drawing sixteen feet can enter it with high-water at neap tides. There are large warehouses and timber-yards attached to the harbour. The town formerly consisted of two parishes now united. The church of St. James, now the only one, is a large cross church, with a tower in the centre; the architecture is in a great degree early English; the west door is Norman. There are in the church some antient monuments and inscriptions, and a large font of early English character. There is a small ill-managed borough gaol. There are a tan-yard, two bone-mills, some corn-mills, and a large ropery for making patent cordage of phormium tenax, which has not been very successful. The market is on Friday.

Grimsby is a borough by prescription; the council under the Municipal Reform Act consists of four aldermen and twelve councillors. The parliamentary borough, which was considerably enlarged by the Boundary Act, includes, besides the municipal borough, the rest of the parish of Grimsby, and the parishes of Great Coates, Little Coates, Bradley, Laceby, Waltham, Scartho, and Clee, with the township of Cleethorpe, containing an additional population of 2364; making in all 6589. Clee has an antient church, with some fine Norman piers and arches.

The living of Grimsby is a vicarage, in the archdeaconry of Lincoln, of the clear yearly value of 532*l.* There are several dissenting places of worship.

There were in the parish, in 1833, one infant school, with 20 children, partly supported by the corporation; a grammar-school, with 60 boys and 20 girls; a school preparatory to the grammar-school, with 54 boys and 19 girls; and a school for dissenters, with 22 children: the first two of these schools were wholly and the third partly supported by the corporation: four other day-schools, with 114 children; one boarding-school, with 23 children; and one Sunday-school, with 110 children.

Alford is in the hundred of Calceworth, in the parts of Lindsey, 140 miles from London by Boston and Spilsby, and near the head of a small stream which flows into the sea. The parish contains 1410 acres, with a population, in 1831, of 1784, about one fourth agricultural. The town consists chiefly of one street. The church is an insignificant building. There are one or two dissenting meeting-houses. The market is on Tuesday. The living is a vicarage, united with the chapelry of Rigsby, in the archdeaconry of Lincoln, of the clear yearly value of 122*l.* There were, in 1833, an endowed grammar-school, with 24 boys; a national school, with 128 children; and five other day and boarding schools, with 190 children.

Bolingbroke is in the soke of Bolingbroke, in the parts of Lindsey, 133 miles from London, by Boston. There was here an antient castle, built by William de Romara, earl of Lincoln, which afterwards came into the hands of the Lacy family, and subsequently into those of John of Gaunt. Henry IV., son of John, was born in this castle, and took from it his surname of Henry of Bolingbroke. There are a few remains, consisting chiefly of the tower at the south-western angle of the castle, which was quadrangular. The parish comprehends an area of 2570 acres, with a population of 725. There is a small manufactory of earthenware. The market is on Tuesday. The church, which is antient, was partly destroyed in the civil wars of Charles I. The living is a rectory, united with the chapelry of Hareby, both in the archdeaconry of Lincoln, of the clear yearly value of 373*l.* There were in the parish, in 1833, one endowed and one other day-school, with 46 children, and one Sunday-school, with 40 children.

Bourn is in Aveland wapentake, in the parts of Kesteven, on the road from London to Lincoln, 97 miles from the former, and 36 from the latter. There was formerly a castle here, which was the seat of a lordship of some note in the Saxon times. Hereward, the Anglo-Saxon chieftain who opposed the most protracted resistance to the Norman conquerors, was the son of the lord of Bourn, or Brunne. The parish comprehends 8190 acres, with a population of 2569: it is divided into three hamlets, of which that of Bourne, with Tongue-End, contains a population of 2355, nearly one-half agricultural. The town consists chiefly of one long street of modern well-built houses. In the centre of the market-place is an antient town-hall, said to have been built by the great Lord Burghley, a native of the town; the lower part is used as a market-house. The church is large, but appears to be only part of a more extensive plan. The piers and arches of the nave are of Norman, the clerestory of perpendicular date. At the west end, portions in the perpendicular style have been ingrafted upon others of an early English character. There are two towers at this end. Wool-stapling and tanning are carried on, and the the town has some trade in leather and wool: there is a navigable canal communicating with the river Glen. A tesselated pavement and some Roman coins have been dug up in the neighbourhood, and there are the traces of the site of an Augustinian priory, the revenue of which at the Dissolution was 197*l.* 17*s.* 5*d.* gross, or 167*l.* 14*s.* 6*d.* clear. There are some dissenting places of worship. The living is a vicarage, in the archdeaconry of Lincoln, of the clear yearly value of 320*l.*, with a glebe-house. There were, in the year 1833, in the parish, one dame-school, with 20 children; an endowed school, with 18 boys; a national school, with 125 children; nine other day-schools, with 167 children; and two Sunday-schools, with 169 children.

Caistor, or Castor, is in the wapentake of Yarborough, in the parts of Lindsey. Its name indicates it to have been a Roman station: by the Saxons it was called Thong Castor. Some Roman and Saxon antiquities have been discovered here. The whole parish, which extends into the wapentake of Walshcroft, contains 4470 acres, with a population of 1525: the chapelry of Holton-le-Moor contains 1750 acres, with a population of 150, leaving for the part of the parish which contains the town 2720 acres and 1375 inhabitants, of whom about a sixth are engaged in agriculture. The church is partly of Norman, partly of early English character. The town has a market on Saturday. The living is a rectory, united with the chapelries of Houghton and Clixby, exempt from the archdeacon's jurisdiction, of the clear yearly value of 215*l.*, with a glebe-house. There were in the parish (exclusive of Holton chapelry), in 1833, an endowed day-school, with 74 children; eight other day-schools, with 194 children; a national Sunday-school, with 144 children; and another Sunday-school, with 70 children.

Corby is in the wapentake of Beltisloe, parts of Kesteven, 105 miles from London by Bourne. The parish comprehends 3790 acres, with a population of 654, above half agricultural. The market, which has almost fallen into disuse, is on Thursday. The living is a vicarage, united with the rectory of Irnham and the chapelry of Bulby, all in the archdeaconry of Lincoln, and of the joint yearly value of 608*l.*, with a glebe-house. There were in Corby parish, in 1833, an endowed free-school, with from 10 to 25 scholars; two other day-schools, with 38 children; and one Sunday-school, with 82 children.

Deeping, distinguished from some neighbouring places of the same name as Market Deeping, is in the wapentake of Ness, in the parts of Kesteven. It is 90 miles from London, on the road to Lincoln. The parish comprehends 1290 acres, and had in 1831 a population of 1091. The houses are mostly old and ill built. The market is on Thursday. Some trade is carried on by the Welland. The church contains some traces of Norman and some portions of early English architecture; the tower and other parts are of perpendicular character. The living is a rectory of the clear yearly value of 579*l.*, with a glebe-house. There were in 1833 an endowed day-school with 70 scholars; six other day-schools with 173 children; and one Sunday-school, supported out of the poor-rates, with 80 children.

Deeping St. James is a village so near to Market Deeping as almost to constitute one town with it. The parish has an area of 6470 acres, with a population of 1587. The church, originally a chapel, built by the monks of Croyland, is large and curious, chiefly in the Norman and early English styles: it contains a curious Norman font. There is an antient stone cross in this village. The living is a vicarage of the clear yearly value of 191*l.*, with a glebe-house. There were in 1833 three day-schools with 85 children; a national school with 100 children; and a Sunday-school with 64 children.

Donington is in the wapentake of Kirton, in the parts of Holland. It is 110½ miles from London, on the left of the road to Boston. The parish comprehends an area of 6180 acres, with a population in 1831 of 1759, more than half agricultural. Hemp is grown in the neighbourhood to a great extent; and much hemp-seed is sold. The church is dedicated to St. Mary and the Holy Rood; there are one or two Dissenting places of worship. There is a market on Saturday. The living is a vicarage in the archdeaconry of Lincoln, of the clear yearly value of 126*l.*, with a glebe-house. There were in the parish in 1833 four dame-schools with 28 children; four endowed day-schools with 315 children; and one Sunday-school with 20 children.

Falkingham, or Folkingham, is in the wapentake of Aveland, in the parts of Kesteven, 106 miles from London on the road to Lincoln. Here was antiently a castle on the eastern side of the town, but only the moats and mounds remain. The parish comprehends 1700 acres, and had in 1831 a population of 744, above half agricultural. The streets are clean and well paved. The church is large and handsome, chiefly of perpendicular character; the tower has eight pinnacles and a rich battlement. A small gaol was erected thirty years ago on the site of the antient castle, and has been since enlarged. The market is on Thursday. The living is a rectory united with the vicarage of Laughton, both in the archdeaconry of Lincoln, of the clear yearly value of 511*l.* There were in the parish in 1833 an endowed day-school with 30 children; four other day-schools with 66 children; one boarding and day school with 36 children; and one Sunday-school with 131 children.

Glanford-Brigg, or Glanford-Bridges, or by familiar abbreviation Brigg, is in the wapentake of Yarborough, in the parts of Lindsey, 23 miles from Lincoln, and 156 miles from London on the road to Barton-upon-Humber. The chapelry of Glanford-Brigg is in the parish of Wrawby with Kettleby, which comprehends 5070 acres, and had in 1831 a population of 2418, of whom 1780 were in Glanford chapelry. The town is advantageously situated a short distance to the east of the Ancholme navigation, by means of which a considerable trade is carried on in corn, coal, and timber. Besides the Episcopal chapel there are Dissenting and Catholic places of worship. The market is on Thursday. The chapelry is annexed to the vicarage of Wrawby, which is in the archdeaconry of Lincoln, of the clear yearly value of 220*l.*, with a glebe-house. There were in 1833 in the chapelry three dame schools, with about 50 children; an endowed day-school with 21 children; four other day-schools with 125 children; one boarding and day school with 54 children; and three Sunday-schools with 387 children.

Holbeach is in the wapentake of Elloe, in the parts of Holland, 109 miles from London, a few miles to the right of the road to Boston. The parish comprehends an area of 20,240 acres, with a population in 1831 of 3890, chiefly agricultural. The town is indifferently built and is in a low marshy district. The church is a large and handsome building, consisting of a nave, chancel, aisles, and square tower, surmounted with an ornamented octangular spire. The market is held on Thursday. The living is a vicarage in the archdeaconry of Lincoln, of the clear yearly value of 702*l.* There were in 1833 an endowed day-school with 101 children; a day-school, partly supported by subscription, with 40 children; nine other day-schools with 349 children; and three Sunday-schools with 275 children.

Horncastle is in the soke of Horncastle, in the parts of Lindsey, 136 miles from London by Sleaford and Tattershall. It is supposed to have been a Roman station; some think that it was the Bannovallum of Ravennas. There are traces of a fortification yet visible, which was a parallelogram enclosing an area of twenty acres, and comprehending a considerable part of the modern town. Roman coins and other antiquities have been discovered, and at the point formed by the junction of the Waring and the Bain is an intricate circle or labyrinth called Julian's Bower. The name Horncastle is derived from the Saxon word *hyrn*, a corner, and is descriptive of the situation of the place in the angle formed by the junction of the above-mentioned rivers. The town, which is pleasantly situated at the foot of the Wolds, has been much improved, and consists of respectable well-built houses. The church has been in great part rebuilt of late years. Part of it is as antient as the time of Henry VII. There are several Dissenting meeting-houses. Corn and wool are the principal articles of commerce, which has been much promoted by the opening of the Horncastle navigation from this town to the Witham. The market is held on Saturday, and there are three fairs in the year, one of them probably the largest horse-fair in the kingdom. The area of the parish is 2510 acres; the population in 1831 was 3988, about one-tenth agricultural. The living is a vicarage in the archdeaconry of Lincoln, of the clear yearly value of 612*l.*, with a glebe-house. There were in 1833 three dame-schools with 58 children; a Lancasterian school with 145 children; one national day and Sunday school with 225 day scholars, and 189 on Sundays; thirteen other day-schools with 331 children; two boarding and day schools with 84 children; and two Sunday-schools with 186 children. There were two endowed schools (one a grammar-school) from which no return was made. There are two public libraries, a subscription library of 1000 volumes, and a clerical library.

Kirton (distinguished as Kirton in Lindsey from another place of the same name in the parts of Holland) is in the wapentake of Corringham, in the parts of Lindsey, about 150 miles from London to the left of the Barton road. It is situated on the slope of that range of hills which extends from Lincoln to Barton-upon-Humber and overlooks the valley of the Trent. The parish comprehends 4210 acres; with a population in 1831 of 1542, more than one-third agricultural. The quarter-sessions for the parts of Lindsey are held here by adjournment; and there are a court-house and house of correction. There is a market on Saturday. The church is large and has a considerable portion of good early English work; there are meeting-houses for Methodists and Baptists. The living is a vicarage in the archdeaconry of Stow, of the clear yearly value of 249*l.* There were in the parish in 1833 an infant-school with 58 children; an endowed national day and Sunday school, with 105 children in the week, and 100 on Sundays; nine other day-schools with 150 children; and one Sunday-school with 99 children.

Louth is in the hundred of Louth Eske, in the parts of Lindsey, 148 miles from London by Boston and Spilsby. There were antiently three religious establishments (two 'guilds' and a 'chantry'), the funds of which are now appropriated to the grammar-school. The parish comprehends an area of 3620 acres, with a population in 1831 of 6976, about one-eighth agricultural. The town is in a pleasant situation at the eastern foot of the Wolds, and on the bank of the little river Ludd, over which there is a bridge. It is well built; the houses are of brick, and the streets are well paved and lighted. The church is one of the finest in the county: it consists of a nave, chancel, and two aisles, with a lofty and elegant tower, surmounted by a rich octangular crocketed spire, at the west end. The exterior presents a fine specimen of perpendicular architecture: the east window is remarkable for its beautiful tracery. The angles of the tower are supported by rich buttresses which terminate in octangular crocketed pinnacles; there are flying buttresses from the spire to these pinnacles. The height of the spire is 288 feet. The grounds of the vicarage-house are curiously laid out as if attached to a hermitage, and are interspersed with seats, cloisters, and other appropriate buildings. There are a sessions-house and a house of correction for the division; a modern guildhall; an assembly-room; a small theatre; and a public subscription library and news-room. There are some manufactories of worsted, carpets, rugs, and blankets, which give employment to about 100 people; a soap manufactory, a paper-mill, and breweries. Trade is carried on in wool and corn. The Louth navigation extends from the town to the ocean just at the mouth of the Humber. The markets are on Wednesday and Saturday, and there is a weekly market for cattle on Friday during the spring. The quarter-sessions for the division are held alternately here and at Spilsby. The town was incorporated by Edward VI.: by the late Municipal Reform Act it was divided into two wards, and has 6 aldermen and 18 councillors. The borough is coextensive with the parish. The living is a vicarage in the archdeaconry of Lincoln, of the clear yearly value of 300*l.*, with a glebe-house. There are several Dissenting places of worship. There were in 1833 an infant-school with 130 children, a dame-school with 20; a free grammar-school, with a large endowment, with 80 children; another endowed day-school with 25 children; thirteen other day-schools with 322 children; a national day and Sunday school with 284 scholars during the week, and 59 on Sundays; and three Sunday-schools, with 580 children.

Market-Rasen, or Raisin, is in the hundred of Walshcroft, in the parts of Lindsey, on a little brook, the Rase or Raisin, which joins the Ancholme, nearly 148 miles from London by Lincoln. The parish comprehends 1220 acres, and had in 1831 a population of 1428, about one-sixth agricultural. The parish-church is commodious. The Roman Catholics and Methodists have meeting-houses: there is an hospital or almshouse for four poor men. The market, which is on Tuesday, is well frequented. The Ancholme navigation begins here. The living is a vicarage in the archdeaconry of Lincoln, of the clear yearly value of 223*l.*, with a glebe-house. There were in 1833 ten day-schools (one of them with a small endowment) with 201 children; one boarding-school with 4 children; and two Sunday-schools with 282 children.

Sleaford is in the wapentake of Flaxwell, in the parts of Kesteven, 115½ miles from London on the road to Lincoln. It is on the little river Slea, or Sleaford, which flows into the Witham, and is called New Sleaford to distinguish it from the adjacent village of Old Sleaford. Stukely conjectured, but on insufficient grounds, that the Romans had a station here. Roman coins have been dug up. The bishops of Lin coln had a castle here, which is now quite levelled with the ground. The parish comprehends 1800 acres, with a population in 1831 of 2450, scarcely any of it agricultural, beside the hamlet of Holdingham, 1360 acres, and 137 inhabitants, chiefly agricultural. The town has been much improved of late years: the streets are paved and lighted. The church consists of a nave with side aisles, and a large chapel or transept on the south side, and another transept on the north, and a chancel without aisles: there is a tower surmounted with a spire rising to the height of 144 feet. The steeple is the most antient part of the church, and is of early English character, the upper part and the spire being of somewhat later date than the rest: the aisles and the north transept are of decorated character, and the piers and arches of the nave, the clerestory, and the chancel chiefly of perpendicular date. The west front is very fine: and the design and execution of most parts of the church are excellent. There are some Dissenting places of worship; and a town-hall of modern architecture. The market is on Monday.. The Sleaford canal is cut from this town to the Witham. The living is a vicarage, exempt from the archdeacon's visitation, of the clear yearly value of 170*l.*, with a glebe-house. There were in 1833, in the parish, an endowed day-school with 40 children; seven other day-schools with 388 children; and three Sunday-schools with 311 children.

Spalding is in the wapentake of Elloe, in the parts of Holland, 101 miles from London on the road to Boston. It was a place of some consequence even in the Saxon times. There was a monastic establishment here, which underwent many changes. Its revenue at the dissolution was 878*l.* 18*s.* 3*d.* gross, or 767*l.* 8*s.* 11*d.* clear. The parish comprehends 12,070 acres, with a population in 1831 of 6497, about one-third agricultural. The town is situated on the banks of the Welland, in a fenny district, but well drained; the streets are clean and well paved, and the houses neat. The church, which is mostly of perpendicular character, has a fine tower and crocketed spire. There is a town-hall or court-house, a substantial brick building, in the market-place. There are assembly-rooms and a small theatre. The town derives its principal support from being the emporium for the neighbouring agricultural district. The Welland is navigable for vessels of 40 or 50, or even 70 tons, up to the town, and there is a considerable coasting and carrying trade. The market is on Tuesday, and is very prosperous. Long wool is sent from this neighbourhood for the supply of Norwich and the manufacturing towns of Yorkshire. The living is a perpetual curacy, in the archdeaconry of Lincoln, of the clear annual value of 950*l.*, with a glebe-house. There were in 1823 a free grammar-school with 5 scholars; another endowed free-school for 60 boys; a free-school called 'The Bluecoat-school,' with 50 free and 24 pay scholars; twenty-four other day-schools with 614 children; and five Sunday-schools with 705 scholars.

Spilsby is in the soke of Bolingbroke, in the parts of Lindsey, 133½ miles from London through Boston. The parish comprehends 2340 acres, with a population in 1831 of 1384, of which a very small portion was agricultural. The town consists of four streets meeting in a spacious market-place. The town-hall, a plain brick building on arches, stands at one end of a row of houses in the centre of the market-place, and the market-cross, a plain octangular shaft rising from a quadrangular base and terminating in a vane, at the other end. The church is an irregular pile, having at the west end a handsome tower of later date than the rest of the building: it contains several antient monuments. There is a weekly market on Monday. The living is a perpetual curacy, in the archdeaconry of Lincoln, of the clear yearly value of 109*l.* There were in 1833 three dame-schools with 50 children; one day-school, partially endowed, with 60 scholars; a national day and Sunday school, with 75 children in the week and 70 on Sundays; another national school with thirty scholars; three other day-schools with 52 scholars; and one Sunday-school with 110 children.

Swineshead, is in the wapentake of Kirton, in the parts of Holland, 113½ miles from London, and 7 from Boston. There was formerly a Cistertian abbey here, founded A.D. 1134, by Robert de Groslei; the yearly revenues at the dissolution were 175*l.* 19*s.* 10*d.* gross, or 167*l.* 15*s.* 3*d.* clear. Leland reduces them to 80*l.* In this monastery King John appears to have rested after his escape with his life in crossing the Wash, where he lost his baggage. His death, which occurred at Newark shortly after, was by some ascribed to poison administered by a monk of Swineshead. The parish comprehends 6100 acres, and had in 1831 a population of 1994, about half agricultural. Swineshead was formerly a port, and the sea flowed up to the market-place, where there was a harbour. The market is on Thursday, but it is almost disused. The church is a handsome spacious building with a lofty spire. The living is a vicarage, in the archdeaconry of Lincoln, of the clear yearly value of 240*l.* There were in the parish in 1833 an endowed day-school with 90 scholars; six other day-schools with 154 scholars; and one Sunday-school with 75 children. There is in the town a circular Danish encampment, sixty yards in diameter, surrounded by a double fosse.

Tattershall is in the wapentake of Gartree, in the parts of Lindsey, 127 miles from London through Sleaford. It is on the little river Bain, just above its junction with the Witham. Here was formerly a strong castle built by the Fitz-Eudos, barons of Tattershall, and improved by Cromwell, Treasurer of the Exchequer to King Henry VI. The site is marked by two fosses, the outer one of earth, the inner one ten feet deep, faced with brick, and occasionally filled with water from the river. The principal gateway was standing till of late years: a square brick tower built by Treasurer Cromwell is still remaining: it is flanked by octangular turrets which were crowned with spires covered with lead; three of these spires yet remain. The main walls rise to the top of the fourth story, where a capacious machicolation encompasses the tower, on which rises a parapet wall of vast thickness, with arches for the protection of those employed at the machicolations; above this is a second platform with a parapet and embrasures. The tower is in tolerable preservation.. The parish comprehends 3840 acres, with a population in 1831 of 599, two-fifths agricultural. The town is much decayed. The church is a beautiful and spacious edifice, in the form of a cross. It has however suffered much from dilapidations. The windows of the choir were glazed with beautiful stained glass, which was removed by a former marquis of Exeter on condition of replacing it with plain glass; but the condition was never fulfilled, and the interior has suffered much from the exposure: a rich carved wooden screen and stalls are nearly rotten. The Horncastle navigation passes through the town; but there is little trade. The market is now held on Thursday. The living is a donative exempt from the archdeacon's visitation, of the clear yearly value of 110*l.* There were in 1833 a boarding and day school with 25 children; two day-schools with 10 or 12 children in each; a national school attended by 104 children in the week and 62 on Sundays; and one Sunday-school with 18 or 20 children. Mineral waters have lately been discovered at Woodhall between Tattershall and Horncastle, which are coming into repute: handsome baths are built, and an hotel is in course of erection.

Wainfleet is in the wapentake of Candleshoe, parts of Lindsey, 133 miles from London through Boston. If is supposed to have been a Roman station, the Vainonas of the geographer Ravennas. The haven was antiently frequented by ships, but it was going to decay in Leland's time. The waters have been so lowered by a drain, that it is now used only for small craft. The town is supposed to have stood formerly higher up the creek, where the old church of All Saints stands. The parish of Wainfleet All Saints comprehends 1830 acres, with a population in 1831 of 1135, about one-fourth or one-fifth agricultural; that of Wainfleet St. Mary comprehends 6440 acres, with a population of 660, almost entirely agricultural: together 8270 acres, with a population of 1795. All Saints church is a handsome building fast going to decay: it has a brick tower of modern date. St. Mary's church is also much decayed. There is a school-house for the free grammar-school, founded by William of Waynflete, bishop of Winchester, in the fifteenth century. The market is held on Saturday, but is almost disused. The living of All Saints is a rectory, of the clear yearly value of 322*l.*; that of St. Mary is a vicarage, of the clear yearly value of 201*l.*, with a glebe-house; both are in the archdeaconry of Lincoln. There were in 1833, in the two parishes, a dame-school with 16 children; William of Waynflete's free grammar-school, with 42 children; an endowed free-school, supported by the governors of Bethlehem Hospital, with 133 children; nine other day-schools with 222 children; and three Sunday-schools with 387 children: one of the Sunday-schools, with 105 children, was supported by the governors of Bethlehem Hospital. William of Waynflete was of this town; his name was William Partin. He founded Magdalen College, Oxford.

Wragby is in the wapentake of Wraggoe, parts of Lindsey, 144 miles from London through Lincoln. The parish comprehends 1710 acres, with a population in 1831 of 601, more than a fourth agricultural. The town is neatly built and pleasantly situated. A handsome new church was built in 1837, by Mr. Turner, the proprietor of the town. There is a Methodist meeting-house; also an almshouse for six clergymen's widows and six other persons, with a chapel. The market is on Thursday. The living is a vicarage united with the rectory of East Torrington, both in the archdeaconry of Lincoln, and of the joint yearly value of 327*l.*, with a glebe-house. There were in 1833 an endowed day-school with 20 children; another day-school with 25 children; and a Sunday-school with 28 children.

The following places had markets, now disused.—Binbrook is in Walshcroft hundred, parts of Lindsey. It lies in the Wolds between Caistor and Louth, out of any great road. It consists of two parishes, St. Gabriel and St. Mary, having a joint area of 6070 acres, with a population in 1831 of 1030, more than two-thirds agricultural. There are extensive rabbit-warrens in the neighbourhood, and considerable business is done in dressing skins for furriers. The living of St. Gabriel is a vicarage, of the clear yearly value of 75*l.*, exempt from the archdeacon's visitation; that of St. Mary is a rectory, in the archdeaconry of Lincoln, of the clear yearly value of 291*l.* There were in 1823, in the two parishes, four day-schools with 75 children, and two Sunday-schools with 184 children.

Burton, distinguished from other places of the same name as Burton-upon-Stather, is in the wapentake of Manley, parts of Lindsey, 169 miles from London through Newark and Gainsborough. The parish comprehends an area of 3860 acres, with a population in 1831 of 760, three-fifths agricultural. The town was formerly more extensive, but different calamities that have happened to it have combined with the rise of Gainsborough to reduce it; its market has consequently been given up of late years. It is on a hill overlooking the Trent, upon the bank of which there is a wharf. The living is a vicarage united with the rectory of Flixborough, both in the archdeaconry of Stow, and of the joint yearly value of 752*l.*, with a glebe-house. There were, in 1833, five day-schools (one partly supported by a yearly donation), with 130 children; and two Sunday-schools, with 107 children.

Crowland or Croyland is in the wapentake of Elloe, parts of Holland, near the old channel of the Welland, and near the south border of the county, 87 miles from London, through Huntingdon, Ramsey, and Thorney. It is a place of considerable antiquity and interest. It has been conjectured to have been a Roman station; but though various Roman antiquities have been discovered in the neighbourhood, they are not sufficient to support the conjecture. In the time of the Anglo-Saxon kingdoms, a monastery was founded here by Ethelbald, king of Mercia, about the beginning of the eighth century. The first building is said to have been of timber; and, from the marshy character of the soil, was founded upon piles. In or about A.D. 870, in the reign of Ethelred I., this monastery, with several others, was destroyed by the Danes. In the latter part of the eleventh century, the monastery, which had been restored, was again destroyed by fire, but was rebuilt a few years afterwards, with funds partly, if not wholly, raised by the sale of indulgences. Five thousand persons are said to have been present at the laying of the first stone; and the abbey, thus restored, increased rapidly in wealth and reputation. At the dissolution, its yearly revenues were estimated at 1217*l.* 5*s.* 11*d.* gross, or 1083*l.* 15*s.* 10*d.* clear. The buildings of the abbey were much injured during the siege of Croyland, which the royalists had fortified, by the parliamentary forces under Cromwell: there are yet standing however considerable remains of the church. This building was originally cruciform, with a central tower, which probably rose little above the roof of the church: there was a campanile tower at the eastern end of the church. After the dissolution the transepts and choir were pulled down; the nave with its side aisles was left for use as the parish church; but the damage sustained in the civil war led to the church being transferred to the north aisle of the nave; and the centre and south aisle were abandoned to decay, in which state they now remain. The architecture of the building varies; part is of Norman, part of Early English, and part of Perpendicular architecture. At the west end of the present church is a massive tower of Perpendicular character: the western entrance to what was the central part of the nave is one of the most beautiful specimens of rich Early English in the kingdom. The groining of the roof of the present church is very good, and the original windows have been fine ones. There are some antient screen-work and an antient font. The very foundations of the other conventual buildings have been destroyed.

On the west side of the church is the triangular bridge at the confluence of two streams. There is no record of its erection, but from its style, which is Decorated English, it may be ascribed to the fourteenth century. It consists of three semi-arches meeting in a common centre, and forming by their junction as many pointed arches. The bridge is too steep for carriages, and is little used even for horses. It is supposed to have been designed as a symbol of the Trinity. At one angle of the bridge is the statue of some king much decayed.

The parish comprehends 12,780 acres, with a population in 1831 of 2268, nearly two-thirds agricultural. The village is surrounded by fens, and the inhabitants are engaged in grazing, in the dairy, or in the breeding or taking of geese and wild-fowl. The market has been removed to Thorney. The living is a rectory, in the archdeaconry of Lincoln, of the clear yearly value of 115*l.*, with a glebe-house. There were in 1833 nine dame-schools, with about 100 children; eight day-schools, with 225 children; and two Sunday-schools, with 206 children.

Navenby is in the hundred of Boothby Graffo, parts of Kesteven, on the road from Grantham to Lincoln, 124 miles from London. The church is partly of Early English and partly of Decorated English architecture. The windows of the chancel are very fine specimens of Decorated character, particularly the east window, the mullions and tracery of which are remarkably graceful. The parish comprehends 2110 acres, with a population, in 1831, of 778, above half agricultural. The market, formerly held on Thursday, has fallen into disuse. The living is a rectory, in the archdeaconry of Lincoln, of the clear yearly value of 588*l.*, with a glebe-house. There were in 1833 two dame-schools, with 18 children; two day-schools, with 25 children; and one endowed day and Sunday school, with 109 children in the week and 166 on Sunday.

Saltfleet is in the hundred of Louth Eske, parts of Lindsey, 159 miles from London by Sleaford, Horncastle, and Louth. Saltfleet, half a century ago, was a place of some consequence, but is now decayed and is a mere hamlet to the parish of Skidbrooke. Some of the inhabitants are engaged in the oyster fishery; there is a bank of good oysters off the coast. The parish of Skidbrooke contains 2420 acres, with a population of 362, about half agricultural. The living is a vicarage, in the archdeaconry of Lincoln, of the clear yearly value of 271*l.* There were in 1833 two day-schools, with 52 children, and one Sunday-school, with 58 children.

Divisions for Ecclesiastical and Legal Purposes.—This county, as noticed above, is in the diocese of Lincoln, and constitutes the two archdeaconries of Lincoln and Stow. The intended changes in the diocese have been also given. The archdeaconry of Lincoln is subdivided into the following rural deaneries:—1, Lincoln; 2, Aswardburn, or Aswardburn-cum-Lafford; 3, Aveland; 4, Beltisloe or Beltislaw; 5, Bolingbroke or Bullingbrook; 6, Candleshoe; 7, Calceworth or Calcewarth; 8, Gartree; 9, Grantham; 10, Graffo or Graffoe; 11, Grimsby Hill; 12, Horncastle; 13, Longobovey; 14, Loveden; 15, Lowth-cum-Ludbrook; 16, Ness, or Nesse; 17, Stamford; 18, Walshcroft or Walscroft; 19, Wraggoe or Wraghoe; and 20, Yarborough or Yarburgh. The archdeaconry of Stow is divided into the following rural deaneries:—1, Aslacoe or Aslacko; 2, Corringham; 3, Lawress; and 4, Manley or Manlake. The number of parishes is given by Camden at 630. In Lewis's 'Topographical Dictionary' they are given at 609, of which 305 are rectories, 244 vicarages, and the remainder perpetual curacies, chapelries, or donatives. The diocese of Lincoln is in the ecclesiastical province of Canterbury.

Lincolnshire is in the midland circuit. The assizes are held at Lincoln, where is the county gaol. The quarter-sessions are held as follows: for the county of the city of Lincoln, at Lincoln; for the parts of Kesteven and Holland, the Epiphany, Easter, and Midsummer sessions, at Bourn; the Michaelmas session, at Boston: for the parts of Lindsey, for one division, at Kirton in Lindsey; and for the other division, the Epiphany and Midsummer sessions at Spilsby, and the Easter and Michaelmas sessions at Louth.

Before the passing of the Reform Act the county returned two members, who were elected and the poll taken at Lincoln. Two members each were returned for the city of Lincoln, and for the boroughs of Boston, Grantham, Grimsby, and Stamford.

By the Reform and Boundary Acts the county was divided into two parts, each to return two members. The northern division comprehends the parts of Lindsey: the election takes place at Lincoln, and the polling stations are Lincoln, Gainsborough, Epworth, Barton, Glanford Brigg, Market-Rasen, Grimsby, Louth, Spilsby, and Horncastle. The southern division comprehends the parts of Kesteven and Holland: the election takes place at Sleaford, and the polling-stations are Sleaford, Boston, Holbeach, Bourn, Donington, Navenby, Spalding, and Grantham.

History and Antiquities—At the time of the Roman conquest Lincolnshire constituted part of the territory of the Coritani (**Κοριτανοι**), who occupied several of the midland counties, and whose dominion stretched through Lincolnshire to the German Ocean and the Humber. In the division which the Romans made of Britain Lincolnshire was included in the province of Flavia Cæsariensis.

The principal British roads or trackways which passed through Lincolnshire, were Ermine-street, which had two branches; the Foss-way; and what has been termed the Upper Salt-way. Ermine-street, after passing over an angle of the county near Stamford, re-entered it in the neighbourhood of South Witham, between Stamford and Grantham. It immediately divided into two branches, of which the most easterly ran north by Ancaster and Lincoln to Wintringham on the Humber. The other main branch ran north-north-west into Nottinghamshire. The Foss-way commenced on the coast at Grimsby or Saltfleet, or somewhere between them, and ran south-west by Lincoln through Nottinghamshire to Leicester. The Upper Salt-way appears to have been the communication between the coast of Lincolnshire and the salt-works of Worcestershire. Two of these lines of road, the eastern branch of Ermine-street and the Foss, were adopted by the Romans. There were subordinate branches from these roads, and Dr. Stukely considered that there were traces of other Roman roads.

Lindum, the modern Lincoln, was a British town before it was made a Roman station: it is at the intersection of the two great roads, the eastern branch of Ermine-street and the Foss. Ptolemy calls it *Λίνδον*, and mentions it as one of the two chief towns of the Coritani. It was made a Roman station, and according to Richard a Roman colony, whence the latter syllable of its modern name. The station was on the hill now occupied by the cathedral and the castle: its form was that of a parallelogram, the sides nearly facing the four cardinal points; on each side was a gate. The enclosed area was 1200 feet by 1300. The walls have been almost entirely levelled with the ground, and the gates, with one exception, have been long since demolished. The remaining gate, now called 'Newport Gate,' is one of the most remarkable Roman remains in the kingdom. It consists of a central arch nearly sixteen feet wide, and formed with large stones put together apparently without mortar; the height, according to Stukely, was originally above twenty-two feet, but it is now, from the elevation of the causeway, scarcely more than half that height. On each side of the great arch are two lateral arches or posterns, now nearly closed up by the elevation of the soil; these small arches were each seven feet and a half wide by fifteen high. Adjacent to this gate is a mass of the Roman wall; a Roman arch and part of the wall are incorporated with the Norman castle; and another portion of wall parallel to that of the station, and now called 'the Mint Wall,' is supposed to have been part of a granary or of some other Roman building. A fortified wall with towers at the corners appears to have run down to the bank of the Witham, and then along the bank; if any part of this remains, it has been so mingled with later Saxon or Norman workmanship, that it cannot be discriminated. Coins of the emperors Nero, Vespasian, and Julian have been found here, and especially of Carausius, who, as some have supposed, resided for a time at Lincoln. A tessellated pavement and a hypocaust beneath it were discovered in A.D. 1739: the pavement was thirteen feet below the present surface. Another hypocaust and several antiquities have been also discovered, especially a sarcophagus and some stone coffins, earthen and glass urns, and other funereal utensils. Part of a set of glazed earthen conduit-pipes and other specimens of pottery have been also found.

The only other Roman station in the county mentioned in the Antonine Itinerary was Causennæ. Ad Abum, mentioned by Richard of Cirencester, was on Ermine-street, at Winteringham or Winterton, near the south bank of the Humber. The Bannovallum and the Vainonas of the anonymous geographer Ravennas have been fixed at Horncastle and Wainncet. Causennæ was probably Ancaster on Ermine-street, fifteen miles south of Lincoln. Roman coins have been found here. The remains of the station at Winterton, supposed to be Ad Abum, were ploughed up not more than six years before Stukely wrote the account of it, and 'great pavements, chimney-stones,' and other antiquities were found, but not preserved. Three curious tessellated pavements were found here A.D. 1747. At Roxby, Hibbaldstow, Appleby, Sandton, and Broughton, all in the same part of the county, various Roman antiquities have been discovered. At Horkstow also, near Winterton, several Roman remains, chiefly tessellated pavements and the foundations of buildings, have been found. At Torksey, at the junction of the Foss Dyke with the Trent, between Lincoln and Gainsborough, there was probably a Roman settlement. The foundations of the antient Norman castle appear to have been Roman. At Scampton, about six miles north of Lincoln, were discovered in 1795 the foundations of a Roman villa, occupying a site 200 feet square, and having upwards of forty apartments on the ground-plan, with painted and stuccoed walls, and no less than thirteen Roman pavements, only one of which was perfect. Some of the walls were of great thickness. Various Roman antiquities were found scattered over the spot. Upon the banks of the Trent, three miles west of Stow, in the same part of the county, two Roman altars and other antiquities have been discovered. Horsley was inclined to fix the station Segelocum here, on the Lincolnshire side of the stream, instead of placing it at Littleborough on the Nottinghamshire side, where he admits that the town attached to the station stood. Stow is supposed to have been the Sidnaceaster of the Saxons, the seat of a bishopric afterwards transferred to Lincoln. Near Gainsborough and at Aukborough, both on the Trent, are Roman camps: the latter was, in Stukely's time, very perfect, and formed a square of 300 feet; near it was one of those labyrinths, formed of banks, called here and elsewhere Julian's bower. Camps, probably Roman, have been found at Gedney Hill, near Holbeach, and at Honnington, not far from Grantham; a mosaic pavement at Denton, in the same neighbourhood; and Roman coins and pipes of baked earthenware in other places.

Under the Saxons, Lindsey, a name which perhaps extended nearly or quite over the modern county of Lincoln, appears to have been a subordinate state dependent upon the kingdom of Mercia. It was included among the conquests of Edwin of Northumberland, under whose influence Christianity was introduced by the missionary Paulinus. Bede has recorded that Blecca, the governor of Lincoln, was, with his household, among the first converts, A.D. 628.

When the Danes, or Northmen, were carrying on their ravages in England in the time of Ethelred I., Lincolnshire, which then had several monastic establishments, suffered greatly. The narrative of their ravages, given in the pages of the apocryphal Ingulphus, is interesting; and if its authenticity could be depended on, would afford considerable light amid the historic darkness of the period. Early in the year 870 the Northmen landed at Humberstan (Humberstone), near Grimsby, ravaged Lindissy (Lindsey), and marched to Bardeney on the Witham, where was a famous monastery, the monks of which they massacred in the church. About Michaelmas they penetrated into Kesteven, bloodshed and devastation marking their course. Here however they were met by a force thus described by Ingulphus:—'Count Algar (Comes Algarus) and two knights (milites) his seneschals (scheneschalli sui), called Wibert and Leofric (from whose names the aged men and rustics thereabout have since given appellations to the villages where they lived, calling them Wiberton and Lefrinkton), drew together all the youth of Holland (Hoylandia), with a band (cohors) of two hundred men from the monastery of Croyland, stout warriors, inasmuch as most of them were exiles (fugitivi), who were commanded by brother Toly

(Tolius), who had become a monk in that monastery, having been before that the most renowned for military skill in all Mercia, but who had then, from the desire of a heavenly country, given up secular for spiritual warfare at Croyland. They gathered together also about three hundred brave and warlike men from Deping, Langtoft, and Baston (Boston), with whom they joined Morcard (Morcardus), lord of Brunne (Bourne), with his retainers (familia), who were very stout and numerous; they were moreover aided by Osgot, deputy (vicedominus) of Lincoln, a brave veteran, with a band of 500 Lincoln men.' In the first engagement the natives had the advantage; but the reinforcements which joined the invaders in the night struck such terror into the Christians that many fled. The rest having received the sacrament, and 'being fully prepared to die for the faith of Christ and the defence of their country,' marched to the battle. The Northmen, enraged at the loss of three of their kings (who were buried at a place previously called Laundon, but subsequently Trekyngham), fought with the utmost ferocity; but the Christians, though far inferior in number, maintained the combat till nightfall, and were then overcome only by stratagem. Algar and his seneschals and Toly fell; and of the whole body only a few young men of Sutton and Gedeney escaped, who carried the mournful tidings to the monks of Croyland. To that monastery the Northmen soon proceeded, murdered the abbot, and those other inmates who were too old or too young to fly (except one boy of ten years old, whom the compassion of one of the Danish chieftains preserved), and burned the monastery. From Croyland they marched to the monastery of Medeshamsted, now Peterborough, which they also entirely destroyed, having put the inmates, without exception, to the sword.

Lincolnshire passed permanently into Danish hands about A.D. 877; it constituted part of the territory of the Danish burghs of Lincoln and Stamford; and was included within the boundary of the Danelagh, or Danelage (the 'Danish law,' or Danish 'jurisdiction'), as settled by the treaty between Alfred and Guthrun the Dane. The conquest of this part of the island by the Danes appears to have been complete; but the similarity of the laws and institutions of the Anglo Saxons and the Danes diminished the violence of the changes effected by it. Danish names however supplanted the previous Anglo-Saxon ones; and if we may judge by the prevalence of the Danish termination 'by' (as in Grimsby, Saltfleetby, Normanby, Willoughby, &c.), the change must have been made in a great many cases. The denominations of the popular assemblies and tribunals appear to have been changed; the name 'wapentake' superseded that of 'hundred.' In time however the Danish and Anglo-Saxon population became amalgamated, and the whole district came under the supremacy of the Anglo-Saxon crown.

In the civil war between Stephen and the empress Maud Lincolnshire was the scene of contest. The siege and battle of Lincoln, A.D. 1141, have been already noticed. In the broils in which Henry II. was involved with his children, one of the Mowbrays, who had a castle in the Isle of Axholme, and was an adherent of the insurgent Prince Henry, was compelled to submit by the zeal and loyalty of the Lincolnshire men, who crossed over to the island in boats, obliged the garrison to surrender, and razed the castle to the ground. In the civil war of the barons with John and his son Henry III., Lincoln was signalized by a second battle, which seated Henry III., yet a boy, securely on his throne. At the latter part of his reign, when troubles had again broken out, Axholme became once more the refuge of the disaffected. In the civil war of the Roses Lincolnshire appears not to have suffered much. Sir Robert Wells, out of revenge for his father's death, whom Edward IV. had beheaded, raised a rebellion against that prince, and gathered an army of 30,000 Lincolnshire men. He was defeated with dreadful loss near Stamford, and put to death by the king's command. This battle is sometimes called the battle of 'Lose-coat-field' from the vanquished having cast off their coats in order to run away the faster. At the time of the Reformation the Lincolnshire men broke out into open rebellion upon the suppression of the monasteries, A.D. 1536. The rebellion began at Louth, where the ecclesiastical commissioners were to hold a visitation. It was excited by Dr. Makerel, prior of Barlings, or Oxney, between Lincoln and Wragby, and by one Melton, who assumed the name of 'Captain Cobler.' (*State Papers*, published by the Record Commissioners.) The rebellion spread into Yorkshire, where Robert Aske took the command of the insurgents. The Lincolnshire rebels sent in petitions to the king, specifying what they deemed their grievances; and the king gave an answer (*State Papers*, 'Henry VIII.,' part ii., No. xlviii.), in which he designates the shire 'one of the most brute and beestelie of the whole realm.' The earls of Shrewsbury, Rutland, and Huntingdon, and the duke of Suffolk, were sent into Lincolnshire with all the force that could be collected; and the rebels dispersed without coming to an engagement, delivering up their leaders to the king's officers. Dr. Makerel, with the vicar of Louth and thirteen others, were afterwards executed at Tyburn.

Of the ecclesiastical and baronial edifices which were erected between the Conquest and the Reformation, Lincolnshire contains many admirable specimens, especially churches. The cathedral of Lincoln and the churches of Louth, Sleaford, Spalding, and other places, have been already noticed. On the hill which runs from Lincoln towards Grantham is a line of churches, presenting a number of interesting features. Beckingham, Normanton, and Ancaster have considerable portions of Norman character. Caythorpe church is chiefly of Decorated English character, and presents several singularities in its arrangement. Leadenham has a tower and spire of Early Perpendicular date, and of good design; the rest of the church is an excellent example of Decorated English. The churches on and near the road from London to Lincoln exhibit as much, if not more variety and excellence of composition than is to be met with in any part of the kingdom in the same distance: among them are Sleaford, Folkingham, Bourne, and Market Deeping churches. Kelby, Threckingham, Kirby Laythorpe, Howel, Horbling, Sempringham, and Morton have portions of Norman character. Sempringham church appears to be the remains of a much larger building; it has a tower of plain Perpendicular character. Silk Willoughby church is of fine Decorated English character, with a tower and spire of good composition. Walcot has a tower and fine crocketed spire, which are of Decorated English character, as well as the rest of the church; the east window is very fine. Heckington church is one of the most beautiful models of a church in the kingdom, having almost every feature of a fine church. It is a large cross church, having a nave and aisles, spacious transepts, a large chancel with a vestry attached to the north side, and at the west end a tower crowned with four pentagonal pinnacles and a lofty spire.

The finest churches in the Fens are for the most part of Perpendicular character; they have lofty spires, some of them crocketed. The churches already noticed are chiefly in Kesteven and Holland; those of Lindsey are of inferior architecture, except in the flat marshy tract between the Wolds and the Ocean or the Humber, where there are some fine ones. The churches in this district vary but little in their form and character; they have a nave with north and south aisles, a chancel, south porch, and western tower. They are commonly built with good materials. The churches amid the Wolds have little claim to architectural beauty. In the western parts of Lindsey some of the churches are of great antiquity and of considerable architectural beauty. Stow church, in this part, is of considerable size, and chiefly of Norman character.

Of monastic edifices there are several remains. Of Barling's Abbey part of a wall and some fragments of columns remain. Of Thornton Abbey, not far from Barton-upon-Humber, the remains are more important and interesting. It was founded by William Le Gras, or Le Gros, earl of Albemarle, A.D. 1139, as a priory for Black Canons, and was afterwards made an abbey. Its revenues at the dissolution were 730*l.* 17*s.* 2*d.* gross, or 594*l.* 17*s.* 10*d.* clear; after the suppression, Henry VIII. reserved the revenues for the endowment of a college, consisting of a dean and a considerable number of prebendaries; but this also was suppressed in the reign of Edward VI. The buildings were originally extensive, forming a quadrangle surrounded with a moat, and having lofty ramparts for occasional defence. The gate-house, which formed the western entrance, is yet tolerably entire; four handsome hexagonal towers form the four angles of this gate-house. A spacious room, probably the refectory, and an adjoining room with recesses in both ends, the abbey church, and a portion of the octagonal chapter-house, are also standing. The abbot's lodge, which stood to the south, is occupied as a farm-house.

Of Bardney Abbey there are some remains, also of Kirkstead Abbey; both these are on the left bank of the Witham, between Lincoln and Boston. The abbot's lodge of Revesby Abbey, on the north border of the fen country, formed part of an antient house, since used for the offices of the mansion of the late Sir Joseph Banks. Croyland has been described before.

Of Temple Bruer, a preceptory first of Knights Templars, afterwards of Hospitallers, a few vaults and the tower of the church are left; the latter is a massy, quadrangular, stone building, accessible to the top by a winding staircase. The remains of Haverholme Priory, near Sleaford, have been incorporated into a modern mansion.

In the civil war of Charles I. this county was the scene of several important events. In March, 1642, Colonel Cavendish, on the part of the king, took possession of Grantham, and captured 360 prisoners, with a quantity of arms and ammunition, and demolished the works which had been erected. Oliver Cromwell shortly afterwards gained a victory near Grantham with his own regiment of horse over twenty-four troops of royalist cavalry. In May of the same year Colonel Cavendish defeated the parliamentary forces at Ancaster. In the same year Gainsborough was taken by the parliamentarians under Lord Willoughby of Parham. The earl of Kingston, the royalist governor, was taken, and being sent to Hull was shot by the royalists in mistake as he was crossing the Humber. In 1643 Cromwell gained a victory near Gainsborough over the royalists under General Cavendish, who lost his life in the engagement. In autumn the same year the royalists were again defeated at Horncastle; and in 1644 Lincoln castle and minster were stormed by the earl of Manchester, who killed or captured about 800 men. The loss of the assailants did not exceed 50 killed and wounded.

(*Beauties of England and Wales;* Allen's *History of Lincolnshire;* Browne Willis's *Cathedrals; Parliamentary Papers;* Rickman's *Gothic Architecture,* &c.)

STATISTICS.

Population.—Lincolnshire is almost entirely an agricultural county, ranking in this respect the fifth in the list of English counties. Of 79,535 males twenty years of age and upwards, only 167 are employed in manufactures, or in making manufacturing machinery, while 45,272 are engaged in agricultural pursuits, 32,167 of which number are labourers. Of the few engaged in manufactures 28 men are employed at Louth in making carpets, blankets, and worsted. At Owston and West Butterwick 43 men are employed in making sacking, tarpaulins, and wool-sheets; at Haney about 20 in similar occupations. There is a small manufacture of silk shag at Stamford; of mill-machinery at Barton and at Boston; of dressing-machines at Skirbeck; and a few weavers are scattered about the county.

The following summary of the population taken at the last census (1831) shows the number of inhabitants and their occupations in each hundred of the county.

The following Table is a Summary of the Population, &c., of every Hundred, &c., as taken in 1831.

HUNDREDS, CITIES, OR BOROUGHS.	HOUSES.				OCCUPATIONS.			PERSONS.			
	Inhabited.	Families.	Building.	Uninhabited.	Families chiefly employed in Agriculture.	Families chiefly employed in trade, manufactures, and handicraft.	All other Families not comprised in the two preceding classes.	Males.	Females.	Total of Persons.	Males, twenty years of age.
Parts of Holland.											
Elloe, . wapentake	5,723	5,939	44	70	3,540	1,452	947	15,193	14,121	29,314	7,909
Kirton . . „ .	2,873	3,113	5	65	2,101	594	418	7,469	7,308	14,777	3,636
Skirbeck . . „ .	1,372	1,464	8	39	1,011	191	262	3,666	3,550	7,216	1,709
Boston, . . borough	2,437	2,487	5	184	149	1,234	1,104	5,094	6,146	11,240	2,532
Parts of Kesteven.											
Aswardhurn, wapentake	1,256	1,337	1	36	946	281	110	3,279	3,128	6,407	1,639
Aveland . . „ .	1,885	2,049	7	47	1,302	502	245	4,958	5,020	9,978	2,487
Beltisloe . . „ .	1,176	1,273	16	20	865	293	115	3,403	3,027	6,430	1,649
Boothby-Graffo „ .	1,458	1,571	2	35	1,098	295	178	4,000	3,843	7,843	1,982
Flaxwell . . „ .	1,137	1,181	0	47	523	377	281	3,033	2,982	6,015	1,471
Langoe . . „ .	1,533	1,654	7	7	1,263	299	92	3,872	3,684	7,556	1,900
Loveden . . „ .	1,534	1,694	2	41	1,106	370	218	3,957	4,008	7,965	2,004
Ness . . . . „ .	1,359	1,464	4	53	878	380	206	3,489	3,381	6,870	1,732
Winnibriggs and Threo „ .	1,166	1,285	12	20	777	299	209	3,041	3,108	6,149	1,513
Grantham, borough and soke . . .	2,072	2,223	10	59	590	919	714	5,216	5,564	10,780	2,697
Stamford, borough .	1,078	1,204	25	27	64	711	429	2,691	3,146	5,837	1,390
Parts of Lindsey.											
Aslacoe, . wapentake	880	947	1	4	712	169	66	2,486	2,353	4,839	1,274
Bolingbroke . soke	2,114	2,214	5	54	1,444	436	334	5,659	5,460	11,119	2,703
Bradley Haverstoe wapenta.	2,314	2,456	8	106	1,210	636	610	5,953	5,966	11,919	2,973
Calceworth, hundred .	1,961	2,100	0	47	1,404	408	288	5,118	5,148	10,266	2,438
Candleshoe, wapentake	1,639	1,737	8	39	1,152	352	233	4,299	4,217	8,516	2,072
Corringham . „ .	2,846	2,917	17	204	911	921	1,085	6,465	6,718	13,183	3,331
Gartree . . „ .	1,242	1,343	5	24	965	214	164	3,605	3,358	6,963	1,679
Hill, hundred . .	606	696	1	9	498	127	71	1,722	1,698	3,420	847
Horncastle, soke . .	1,677	1,788	4	45	712	558	518	4,261	4,395	8,656	2,148
Lawress, wapentake .	1,327	1,426	12	36	835	337	254	3,660	3,583	7,243	1,869
Louth-Eske, hundred	2,800	2,937	15	123	1,352	875	710	6,904	7,123	14,027	3,368
Ludborough, wapentake	249	290	1	2	240	34	16	741	689	1,430	346
Manley . . „ .	4,467	5,012	11	136	3,099	1,051	862	11,520	11,526	23,046	5,834
Walshcroft . „ .	1,370	1,561	3	56	961	380	220	3,871	3,744	7,615	1,920
Well . . . . „ .	619	661	2	24	466	137	58	1,658	1,536	3,194	891
Wraggoe . . „ .	1,125	1,250	0	19	924	222	104	3,263	3,059	6,322	1,641
Yarborough . „ .	3,903	4,138	11	162	2,181	1,122	835	9,668	9,819	19,487	5,033
Lincoln, city . . .	2,417	2,492	16	128	470	1,108	914	5,644	6,199	11,843	2,898
Totals .	61,615	65,903	268	1,968	35,749	17,284	12,870	158,858	158,607	317,465	79,535

The population of Lincolnshire at each of the four following dates was as under:—

	Males.	Females.	Total.	Increase per cent.
1801	102,445	106,112	208,557	..
1811	117,022	120,869	237,891	14·65
1821	141,570	141,488	283,058	18·98
1831	158,858	158,607	317,465	12·07

showing an increase between the first and last periods of 108,908, or about 52¼ per cent., which is 4¾ per cent. below the whole rate of increase throughout England.

County Expenses, Crime, &c.—The sums expended for the relief of the poor at the four dates of

		£.		s.	d.	
1801	were	95,575,	being	9	2	for each inhabitant.
1811	..	129,343	„	10	10	„
1821	..	168,786	„	11	11	„
1831	..	174,055	„	10	11	„

The expenditure for the same purpose in the year ending March, 1837, was 111,242*l.* If we assume that the population has increased since 1831 in the same ratio as in the ten preceding years, the above sum gives an average of about 6*s.* 6*d.* for each inhabitant. All these averages are above those for the whole of England and Wales.

The sum raised in Lincolnshire for poor-rate, county-rate, and other local purposes, in the year ending 25th March, 1833, was 225,005*l.*, and was levied upon the various descriptions of property as follows:—

On land	£188,927	8*s.*
Dwelling-houses	30,760	18
Mills, factories, &c.	3,355	9
Manorial profits, navigation, &c.	1,961	16
Total	225,005	11

The amount expended was—

For the relief of the poor	£169,073	10*s.*
In suits of law, removal of paupers, &c.	6,750	3
For other purposes	49,073	1
Total	224,896	14

In the returns made up for the subsequent years the descriptions of property assessed are not specified. In the years ending March, 1834, there was raised 228,238*l.*; 1835, 207,367*l.*; 1836, 188,264*l.*; 1837, 133,767*l.*; and the expenditure for each year was as follows:—

	1834.		1835.		1836.		1837.
	£.	s.	£.	s.	£.	s.	£.
For the relief of the poor	161,074	0	146,058	0	131,685	0	111,242
In suits of law, removals, &c.	8,674	0	7,749	0	7,646	0	5,414
Payments towards the county-rate	62,055	0	26,749	0	23 279	0	..
For all other purposes			25,856	0	23,857	0	17,111
Total money expended	£231,803	0	206,412	0	186,467	0	133,767

The saving effected in the expenditure of the poor in 1837, as compared with the sum expended in 1834, was therefore about 31 per cent.; and the saving effected, comparing the same periods of time, in the whole sum expended, was about 42¼ per cent.

The number of turnpike trusts in Lincolnshire, as ascertained in 1835, is 29; the number of miles of road under their charge is 538. The annual income and expenditure in 1835 were as follows:—

Revenue received from tolls	£28,449	17	0
Parish composition in lieu of statute duty	2,269	11	0
Estimated value of statute duty performed	3,745	3	0
Revenue from fines	12	0	0
Revenue from incidental receipts	1,101	19	0
Amount of money borrowed on the security of the tolls	1	4	0
Total income	35,579	14	0

	£.	s.	d.
Manual labour	8,229	17	0
Team labour and carriage of materials	3,000	12	0
Materials for surface repairs	4,416	12	0
Land purchased	42	4	0
Damage done in obtaining materials	245	17	0
Tradesmen's bills	1,191	9	0
Salary of treasurer	215	13	0
„ of clerk	473	4	0
„ of surveyor	1,673	19	0
Law charges	256	12	0
Interest of debt	5,482	17	0
Improvements	1,580	1	0
Debts paid off	1,669	0	0
Incidental expenses	675	13	0
Estimated value of statute duty performed	3,745	3	0
Total expenditure	32,898	13	0

The county expenditure in 1834, exclusive of that for the relief of the poor, was 25,941*l.*, disbursed as follows:—

	£	s.	d.
Bridges, building and repairs, &c.	703	4	0
Gaols, houses of correction, and maintaining prisoners, &c.	8,594	0	0
Shire-halls and courts of justice, building, repairing, &c.	283	9	0
Lunatic Asylums	36	8	0
Prosecutions	2,980	17	0
Clerk of the peace	1,612	9	0
Conveyance of prisoners before trial	516	5	0
Conveyance of transports	37	19	0
Vagrants, apprehending and conveying	338	3	0
Constables, high and special	401	17	0
Coroner	405	4	0
Debt, payment of, principal and interest	7,941	9	0
Miscellaneous	2,089	16	0

The number of persons charged with criminal offences in the three septennial periods ending with 1820, 1827, and 1834, were 1296, 1563, and 2237 respectively; making an average of annually 185 in the first period, of 223 in the second period, and of 319 in the third period. The number of persons tried at quarter-sessions in each of the years 1831, 1832, and 1833, in respect of whom any costs were paid out of the county-rate, was 197, 210, and 244 respectively.

Among the persons charged with offences there were committed for

	1831.	1832.	1833.
Felonies	161	164	214
Misdemeanors	36	46	30

The total number of committals in each of the same years was 225, 243, and 301 respectively.

	1831.	1832.	1833.
Convicted	157	195	244
Acquitted	31	28	31
Discharged by proclamation	34	20	23

At the assizes and sessions in 1837 there were 412 persons charged with criminal offences in this county. Of these 33 were charged with offences against the person, 13 of which were for common assaults: 29 persons were charged with offences against property committed with violence, 325 with offences against property committed without violence; 1 for destroying trees; 1 for uttering counterfeit coin; 16 for riot; 4 for poaching; 1 for perjury; and 2 for minor misdemeanors. Of the whole number committed, 291 were convicted, 83 were acquitted, and against 38 there were no bills found, or no prosecution. Of the whole number of persons convicted, 12 were sentenced to death, but none were executed; the sentences of 9 of them were commuted into transportation for life; of 2 others for periods of 15 and of 7 years; and of 1 into imprisonment for 1 year, or more than 6 months: 13 criminals were sentenced to transportation for life, and 41 for various periods; 9 were sentenced to imprisonment for 2 years, or more than 1; 35 for 1 year or more than six months; and 169 for 6 months or under; 12 were sentenced to be whipped or fined, or were discharged on sureties. Of the whole number of offenders, 345 were males and 67 were females; 136 could not read nor write: 232 could read and write imperfectly; 37 could read and write well; 2 had received superior instruction, and the degree of instruction of the remaining 5 could not be ascertained.

The number of persons qualified to vote for the county members of Lincolnshire is 18,241, being 1 in 17 of the whole population, and 1 in 4 of the male population twenty years and upwards, as taken in 1831. The expenses of the last election of county members to parliament were, to the inhabitants of the county, 1371*l.* 15*s.*, and were paid out of the general county-rate.

This county contains 16 savings' banks; the number of depositors and amount of deposits on the 20th of November, in each of the following years, were as under:—

	1832.	1833.	1834.	1835.	1836.	1837.
Number of Depositors	7,483	7,801	8,528	9,315	10,216	11,150
Amount of Deposits	£224,933	£233,117	£249,397	£267,247	£291,099	£313,388

The various sums placed in the savings' banks in 1835, 1836, and 1837, were distributed as under:—

	1835.		1836.		1837.	
	Depositors.	Deposits.	Depositors.	Deposits.	Depositors.	Deposits.
Not exceeding £20	5,031	£36,516	5,472	£39,715	6,104	£44,336
" 50	2,692	81,777	3,031	98,530	3,139	95,851
" 100	1,087	75,353	1,167	80,431	1,325	90,905
" 150	301	36,435	341	40,800	367	43,685
" 200	153	25,179	157	20,353	170	29,290
Above . 200	51	11,987	48	11,270	45	10,321

Education.—The following particulars are obtained from the Parliamentary Inquiry on Education made in the session of 1835:—

	Schools.	Scholars.	Total.
Infant schools	71		
Number of infants at such schools; ages from 2 to 7 years:—			
Males . .		631	
Females . .		639	
Sex not specified .		501	
			1,771
Daily schools	1,344		
Number of children at such schools; ages from 4 to 15 years:—			
Males . .		16,075	
Females . .		13,603	
Sex not specified .		6,675	
			36,353
Schools .	1,415		
Total of children under daily instruction			38,124
Sunday schools . . .	543		
Number of children at such schools; ages from 4 to 15 years:—			
Males . .		12,765	
Females . .		12,315	
Sex not specified .		6,799	
			31,881

Assuming that the population between two and fifteen years increased in the same ratio as the whole of the population between 1821 and 1831, and has continued to increase in the same ratio since, we find that there must have been living in Lincolnshire (in 1834) 109,656 persons between those ages. A very large number of the scholars attend both daily and Sunday schools. Forty-five Sunday-schools are returned from places where no other schools exist, and the children, 1221 in number, who are instructed therein cannot be supposed to attend any other school. At all other places Sunday-school children have an opportunity of resorting to other schools also; but in what number, or in what proportion duplicate entry of the same children is thus produced must remain uncertain. Forty-three schools, containing 2680 children, which are both daily and Sunday schools, are returned from various places, and duplicate entry is therefore known to have been thus far created. Making allowance for this cause for over-statement, we may perhaps fairly conclude that not as many as two-thirds of the whole number of children between the ages of 2 and 15, were receiving instruction at the time this return was made.

Maintenance of Schools.

Description of Schools.	By endowment.		By subscription.		By payments from scholars.		Subscrip. and payment from scholars.	
	Schls.	Scholars.	Schls.	Scholars.	Schls.	Scholars.	Schls.	Scholars.
Infant Schools	1	112	4	186	59	792	7	681
Daily Schools	157	5,247	70	3,152	1,049	24,571	68	3,383
Sunday Schools	12	715	505	29,825	1	79	25	1,262
Total.....	170	6,074	579	33,163	1,109	25,442	100	5,326

The schools established by Dissenters, included in the above statements, are—

	Schools.		Scholars.
Infant schools . .	—	.	—
Daily schools . .	15	.	413
Sunday-schools . .	147	.	12,149

The schools established since 1818 are—

		Scholars.
Infant and other daily schools	706, containing	20,909
Sunday-schools . .	417 .	26,913

Twenty-five boarding-schools are included in the number of daily-schools as given above. No school in this county appears to be confined to the children of parents of the Established church, or of any other religious denomination, such exclusion being disclaimed in almost every instance, especially in schools established by Dissenters, with whom are here included Wesleyan Methodists, together with schools for children of Roman Catholic parents. Lending libraries of books are attached to 34 schools in this county.

LINDESNAES, CAPE. [TRONDHEIM.]

LINE. The definition of a line, as given by Euclid, will be discussed, with other matters relating to it, in the article SOLID, SURFACE, LINE, POINT (Definitions of).

LINE. The French used to divide their inch into twelve lines, and the line into twelve points, which measures are out of date, since in all scientific investigations the metrical system is adopted. Sometimes, but rarely, the line has been divided into ten points, thus giving 1440 points to the foot: the French metrological writers, particularly the older ones, frequently give the measures of other countries in 1440ths of their own foot. Some English writers have divided the inch into lines. The French line is ·0888 of an English inch, and is also two millimetres and a quarter.

LINEAR (Algebra). As all equations connected with straight lines are of the first degree, the continental writers frequently call equations of the first degree linear equations.

LINEAR DIMENSIONS. [SOLID, SUPERFICIAL, AND LINEAR DIMENSIONS.]

LINEN (French, *Tissue de Lin*; Spanish, *Tela de Lino*; German, *Linnen*; Dutch, *Lynwaat*; Italian, *Tela*; Russian, *Polotno*), cloth woven with the fibres of the flax-plant (*Linum usitatissimum*), a manufacture of so antient a date that its origin is unknown. Linen cloths were made at a very early period in Egypt, as we see from the cloth wrappings of the mummies, which are all linen. It appears also that linen was, in the time of Herodotus, an article of export from Egypt. (ii. 105.)

Until a very recent time little machinery was used in the production of linen cloth. After the separation of the ligneous fibres of the plant [FLAX], the distaff and common spinning-wheel were employed for the preparation of the thread or yarn, and the hand-loom generally, in its simplest form, was used for weaving the cloth. Within the present century the first attempts were made at Leeds to adapt the inventions of Hargreaves and Arkwright to the spinning of flax—attempts which cannot be said to have been generally successful until the last few years, although the coarser qualities of yarns have from the first attempt been so produced in the mills of Messrs. Marshall at Leeds. Mill-spun yarn is now universally employed by the linen-weavers of this kingdom for the production of the very finest lawn, as well as of the coarsest linen; and still more recently the use of the power-loom has been adopted for weaving all but the very finest and most costly fabrics. The consequences of these improvements have been to render this country independent of all others for the supply of linen yarn of every quality, and to diminish in a most important degree the cost of linen fabrics; so that British yarns and cloths are now profitably exported to countries with which the manufacturers of Great Britain and Ireland were formerly unable to compete, and against which they were 'protected' in the home market by high duties on importation.

The growth of the linen manufacture in Ireland is ascribed to the legislative obstruction raised in the reign of William III. to the prosecution in that part of the kingdom of the woollen manufacture, which it was alleged interfered prejudicially with the clothiers of England, the linen weavers being at the same time encouraged by premiums of various kinds distributed by public boards authorised by parliament, and by bounties paid on the exportation of linen to foreign countries.

We have no certain means for ascertaining the growth of the linen manufacture in Ireland. The only facts by which we can approximate to its amount are afforded by custom-house records, which do not reach back to an early date, and are wanting for the years subsequent to 1825, when the intercourse between Great Britain and Ireland was put upon the footing of a coasting trade; and in order to save the salaries of two or three junior clerks, no further record was attempted to be made of its amount or direction. The average quantity of linen exported annually from Ireland, principally to England, in the three years to March, 1790, was 34,191,754 yards. In the three years ending March, 1800, the yearly average was 36,112,369 yards, and the average annual exports in the last three years of each of the next two decennary periods was 40,751,889 yards and 48,265,711 yards respectively. In the six years from 1820 to 1825 the quantity sent from Ireland to Great Britain was—

1820	42,665,928	yards.
1821	45,518,719	„
1822	43,226,710	„
1823	48,066,591	„
1824	46,466,950	„
1825	52,560,926	„

An attempt was lately made by the commissioners appointed to consider and report concerning railway communications in Ireland to ascertain the extent of these exports, and they have stated, as the result of their inquiries, that in 1835 there were shipped from Ireland 70,209,572 yards of linen, the value of which was 3,730,854*l.*

The linen manufacture was introduced into Scotland early in the last century, and in 1727 a board of trustees was appointed for its superintendence and encouragement. Notwithstanding this and the further stimulus afforded by premiums and bounties, the progress of the manufacture in that part of the kingdom was for a long time comparatively unimportant. At Dundee, the great seat of the Scotch linen trade, it is stated that the whole quantity of flax imported in 1745 was only 74 tons, and the quantity of linen sent away did not exceed 1,000,000 yards. In less than half a century after that time the annual importation of flax was 2500 tons, and there were exported 8,000,000 yards of linen beyond the quantity used at home. At this rate the manufacture continued nearly stationary until after the peace in 1815, when a new impulse was given to it; and in 1837 there were imported into Dundee 30,740 tons of flax, besides 3409 tons of hemp, and there were exported from that place 641,938 pieces of different qualities of linen, sail-cloth, and bagging, besides a quantity, computed to be as great, retained for home use.

The bounties allowed on the shipment of linens were graduated according to their quality and value, and ranged from a halfpenny to a penny halfpenny per yard. In 1825 the rates were diminished one-tenth by an act then passed, and an equal proportion was to have been taken off in each subsequent year; so that the whole would have ceased in 1834: but by the act 9 Geo. IV., c. 76 (July, 1828), when one-half the bounties had been removed, this course was modified by continuing for three years the rates of allowance payable in 1829, and thereafter repealing the bounty altogether; so that the payments ceased on the 5th January, 1832. Judging from the extent of our exports before and since the diminution and repeal of the bounties, it does not appear that the manufacture has thence experienced any disadvantage, while the country has saved from 300,000*l.* to 400,000*l.* per annum, formerly paid to enable foreigners to purchase our linen at prices below the cost of production.

The quality of linen yarn is denoted by numbers describing the number of leas (a measure of 300 yards) contained in each pound weight. Thus a pound of No. 60 yarn measures 60 leas, or 18,000 yards, the present price of which is 2*s.* 9*d.* per lb. The following table exhibits the length and value at present (December, 1838) per lb. of yarn of various qualities:—

	Yards.	per lb. *s.*	*d.*		Yards.	per lb. *s.*	*d.*
No. 5	1,500		4	No. 45	13,500	1	11
10	3,000		5½	50	15,000	2	1
16	4,800		8½	60	18,000	2	9
20	6,000		9¾	80	24,000	3	7½
25	7,500	1	1	100	30,000	5	0
30	9,000	1	4¼	150	45,000	8	2
35	10,500	1	6½	200	60,000	13	6
40	12,000	1	8¾				

Linen yarn is seldom spun of greater fineness than No. 200, which is fitted for making cambric of good quality. The production of mill-spun yarn was for a long time confined to Yorkshire, but is now extended to Dorsetshire, Lancashire, Somersetshire, and to Scotland; and recently nineteen mills for the purpose have been erected in and near to Belfast in Ireland. The improvements realized in this branch of the manufacture will be sufficiently indicated by the fact that the *average* fineness of mill-spun yarn made in 1814 was 11·1 leas (3330 yards) per lb., and in 1833 had reached 37·1 leas (11,130 yards) per lb., while the cost had diminished in the proportion of 63¼ per cent. More recent improvements have carried the average degree of fineness to a much higher point, and have still further economized the cost of manufacture. To show the effect which these improvements in the spinning process have had upon finished cloths, it may be mentioned that the price of No. 37 canvas, the quality and dimensions of which are always the same, which in 1814 was 30*s.* per piece, had fallen in 1833 to 18*s.*

The number of flax factories at work in different parts of the kingdom, according to returns made by the inspectors of factories in 1835 was 347, of which 152 were in England, 170 in Scotland, and 25 in Ireland. The number and ages of the persons employed in these mills were—

	Between 8 and 12 Years.		Between 12 and 18 Years.		Above 18 Years.		Total.	
	Males.	Fem.	Males.	Fem.	Males.	Fem.	Males.	Females.
England .	487	434	2,977	5,365	2,551	4,379	6,015	10,178
Scotland .	104	175	1,738	3,982	1,550	5,860	3,392	10,017
Ireland . .	1	15	524	1,507	463	1,171	988	2,693
Total .	592	624	5,239	10,854	4,564	11,410	10,395	22,888
							33,283	

The quantity and value of linen and linen-yarn exported from this kingdom in each of the ten years from 1828 to 1837 have been as under:—

	Linen, yards.	Yarn, lbs.	Declared Value. £.	Exported to the United States of America. Yards.
1828	60,287,814	..	2,120,976	17,832,424
1829	57,698,372	..	1,958,607	18,367,699
1830	61,919,963	..	2,017,776	20,634,766
1831	69,233,892	..	2,400,043	26,501,689
1832	49,531,037	110,188	1,724,789	8,654,423
1833	63,[illegible]32,509	935,692	2,169,979	21,227,807
1834	67,834,306	1,533,325	2,494,303	25,810,656
1835	77,977,089	2,611,215	3,109,774	37,978,974
1836	82,088,760	4,574,504	3,556,908	39,987,620
1837	58,426,333	8,378,100	2,542,732	13,495,453

It will be seen from the last column in the foregoing table that the fluctuations experienced in the amount of our exports have been occasioned by interruptions that have arisen in the prosecution of our trade with the United States of America. Next in importance to the quantity taken by those States are the exports made to our own American and West India colonies, the foreign West Indies, and Brazil. Our shipments of linen and linen-yarn to different European countries are still of comparatively little moment, if we except the exports made within the last few years to France, and which are almost wholly the consequence of improvements in our spinning and weaving processes. The total value of these exports in 1828 amounted to no more than 7,228*l.*, the value of 64,212 yards of linen; whereas in 1837 that country took from us 3,368,388 yards of linen, and 7,010,983 lbs. of yarn, valued together at 543,819*l.*

LINES, in Music, are the five parallel lines forming, together with the intermediate spaces, the staff on which the notes and other characters are placed. [Staff; Leger.]

LINES OF INTRENCHMENT. In the article Encampment it has been stated that armies in the field are not now, as formerly, surrounded by fortifications consisting of a continuous line of works; and that, in general, a few breastworks or redoubts merely are constructed at intervals for the defence of the position. It will be sufficient therefore, leaving out the consideration of those means of defence which are afforded by the natural obstacles of the theatre of war, as escarpments, rivers, marshes, &c., to describe briefly the nature of those intrenchments which were once, in all circumstances, considered indispensable, and which are still, to a certain extent, necessary when an army is to remain strictly on the defensive.

In the first place it may be said that a continuous breastwork would be advantageous for the protection of a frontier, when the absence of natural obstacles might favour the enemy's marauding parties in making inroads for the purpose of levying contributions or laying waste the country; and here a parapet A B, broken by the redans C, C, from whence the defenders might annoy the enemy in flank, on his approach, would suffice. The distances of the redans from one another may be about 150 yards, or not exceeding the range of musket-shot: and such was the construction recommended by Vauban, which, since his time, has been modified by giving to the curtains the form indicated by the lines *a c*, *b c*, in order that the ditch might be more effectually defended from the faces of the redans. These faces should be so disposed that, if produced to an extent equal to the range of artillery, the lines of direction might fall on ground where the enemy could not establish batteries for the purpose of enfilading them; since, in the event of such enfilading taking place, the defenders would be compelled to abandon the parapets; artillery, if placed there, would be dismounted; the palisades in the ditch would be destroyed; and thus little resistance could be made, should the enemy subsequently assault the line. In general the redans may have the form of equilateral triangles, and the lengths of their sides may be about 50 yards. The entrances are usually in the middle of the curtains.

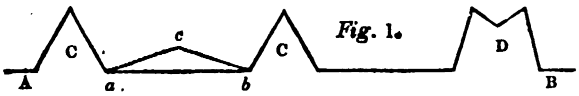
Fig. 1.

Instead of simple redans the advanced parts of the line have occasionally been formed of works resembling two united together, as D; which by the French engineers are called *queues d'hyrondes*.

Again, when the nature of the ground does not permit the intrenchment to be formed with points so far advanced as the vertices of the redans C, C; when, for example, it is required to follow a bank of a river or one side of a road, it is proposed, in preference to a simple straight or curved line, to form the parapet with a series of branches in the positions indicated by *a b*, *c d*, &c., to P. A line of this kind is said to be *à crémaillères;* and in such situations a succession of fires from the branches *a b*, *c d*, &c., may be directed against the enemy during his advance; on a level plain however the longer branches would be subject to the serious defect of being easily enfiladed. The distances between the salient points *b*, *d*, &c., should not exceed 100 yards, and the lengths of the short branches may be about 18 or 20 yards. The re-entering angles *c*, *e*, &c., should contain about 100 degrees; and the entrances are usually placed at those points.

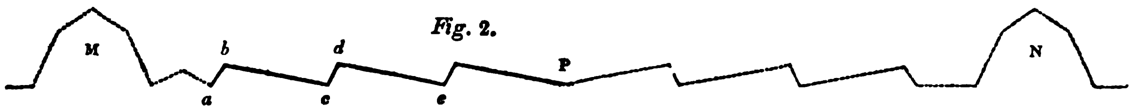
Fig. 2.

A like construction may be adopted when it is required to connect two points, as M and N, by a line along a narrow and elevated ridge of ground; and in this case the directions of the branches *b c*, *d e*, &c., may change in the middle of the line, as shown in the figure, in order that the fire from the short branches may be directed to the front of the nearest works, as M and N, in which it is to be supposed that artillery would be placed for the purpose of defending the ground before the intermediate line.

It may be added also, that the line *à crémaillères* (indented line) would be convenient when the slope of a hill is in its direction, as from M to P; for then, the enemy being supposed to occupy the ground in front of M, the short branches could be easily raised high enough to defilade those which, as *b c*, *d e*, &c., tend towards the foot of the hill.

The most perfect fortification for defending a line of country presenting few natural obstacles to the advance of an enemy, should the importance of the position render it advisable to incur the labour of the construction, would be a series of bastions connected by curtains, either straight or broken. The principles on which the several *fronts of fortification* should be formed correspond to those adopted for regular fortresses, which are described in the article FORTIFICATION, col. 2; the only difference being in the lengths of the several parts. These depend upon the whole length of the front, which here should not exceed 180 yards, that the ditches of the bastions may be well defended by common muskets from the collateral flanks. Neither ravelin nor covered-way would of course be necessary.

Lines of intrenchment composed of works placed at intervals from one another, provided the distances be not so great as to prevent the troops in them from mutually assisting each other, have great advantages over those formed of continuous lines of parapet. In the latter case it is scarcely possible for the army to make a movement for the purpose of attacking the enemy however favourable the opportunity, since much time would be lost in issuing from the line through the narrow passages; and these are the objects against which the fires from the enemy's batteries would then be incessantly directed. Detached works, on the other hand, constitute a number of strong points by which the position of the army is secured; while through the spacious intervals an advance or retreat may take place with all necessary facility. Their artillery is conveniently situated for putting the enemy's line in disorder previously to the attack, and for protecting the retiring columns in the event of their quitting the field. It may be added that detached works are capable of being easily adapted to any kind of ground; for it is merely necessary to place them on the more elevated spots in such situations that the enemy may not be able to penetrate between them without being exposed to their fire.

On level ground the intrenchment may consist of a number of redans, as A, B, C, with or without flanks, disposed on a right line or curve, and at distances from one another equal to about 300 yards, that the fire of musketry from them may defend the intervals. In the rear, and opposite the intervals between the works in the first time, a second line of works, as D, E, should be formed; and the faces of these should be disposed so as to flank the approaches to the others. The gorges of the exterior works should be open, as in the figure, or only protected by a line of palisades, which, in the event of the enemy gaining possession of those works, might be destroyed by the artillery in the second line.

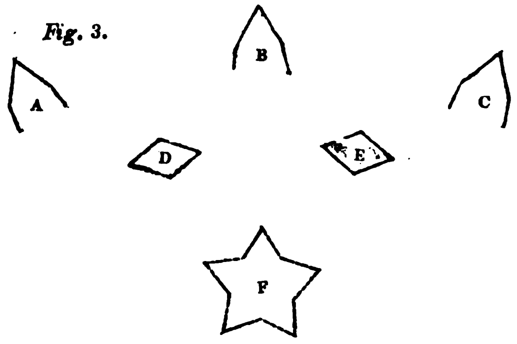
Fig. 3.

Instead of a series of redoubts forming an interior line, it may suffice, should the works A, B, C, &c. be disposed on a convex arc, to have one large central redoubt as F, so situated as by its artillery to defend both the intervals between the redans and the ground within their line.

All the works which have been described consist of parapets formed of earth obtained by cutting a ditch in front; and the profile of any one work with its ditch is shown in the subjoined figure (4).

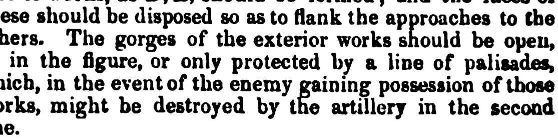
Fig. 4.

The elevation of the crest A above the natural ground is about 7½ feet, unless the vicinity of a commanding height in front should render a greater relief necessary, and the depth of the ditch may be the same. The thickness A *a* of the upper part of the parapet is variable, and depends upon the importance of the work, or rather, upon the arm which may be employed in the attack: if it were required only to resist a fire of musketry, 3 feet would suffice; but from 8 feet to 12 feet would be necessary in the event of artillery being brought against it. (Twelve-pounder shot is the heaviest which the French have ever yet employed in the field.) The form of the parapet is the same as in permanent fortification; when time permits, the exterior and interior slopes should be revêted with sods, and a line of palisades should be planted along the foot of the counterscarp.

LINGUELLA. [INFEROBRANCHIATA, vol. xii.]

LI'NGULA. [BRACHIOPODA, vol. v., p. 313.] Dr. Fitton, in his Stratigraphical Table of Fossils in the strata below the chalk, records three species (one indistinct) from the lower green-sand: two from Kent, and the indistinct one from the Isle of Wight (1836). Mr. Murchison describes and figures several fossil species: one from the old red sandstone, one from the upper Ludlow rock, one from the Aymestry limestone, one from the lower Ludlow rock, one (doubtful) from the same rock, one from the Wenlock shale, and one from the Llandeilo flags. (*Silurian System*, 1839.)

LINGULI'NA. [FORAMINIFERA, vol. x., p. 347.]

LI'NKIA. Nardo has proposed this name for a group of Stellerida included in Asterias by Lamarck. (Agassiz, on Echinodermata, 'Ann. of Nat. Hist.,' vol. i.)

LINKOPING. [SWEDEN.]

LINLEY, THOMAS, a composer who ranks high in what the English have a clear right to call their school of music, though slow in defending it, was born at Wells, about the year 1725. He was first the pupil of Chilcot, organist of the abbey, Bath, and finished his studies under Paradies, an eminent Venetian, who had become a resident in this country. Mr. Linley established himself in the latter city, where he was much sought after as a master, and carried on the concerts in that place, then the resort of all the fashionable world during a part of every year. To the attraction of these, his two daughters, Eliza and Mary, afterwards Mrs. Sheridan and Mrs. Tickell, by their admirable singing, particularly that of the former, which we are told has never been surpassed, contributed very largely.

On the retirement of Christopher Smith, who had been Handel's amanuensis, and succeeded him in the management of the London oratorios, Mr. Linley, by the advice of his son-in-law Mr. Sheridan, united with Mr. Stanley, the blind composer, in continuing those performances; and on the death of the latter, Dr. Arnold joined Linley in the same, an undertaking by no means unprofitable in its results. In 1775 he set the music to Sheridan's opera *The Duenna*, which had a run unparalleled in dramatic annals; it was performed seventy-five times during that season. This led to his entering into a treaty to purchase Mr. Garrick's moiety of Drury-lane theatre; and in 1776 he, conjointly with Mr. Sheridan, bought two-sevenths of it, for which they paid 20,000*l.*, Dr. Ford taking the other three-fourteenths, and the chief management was entrusted to Sheridan, while to Linley was assigned the direction of the musical department. He now devoted his time to the theatre, and, among other pieces, produced his *Carnival of Venice; Selima and Azor*, from the French; and *The Camp*, Sheridan's second production. He also added those charming accompaniments to the airs in *The Beggars' Opera*, which are still in use, and it is to be hoped will long remain unaltered. His Six Elegies, written in the early part of his life, contributed in no small degree to his immediate fame and future fortune; they were sung by all who could sing, and will never cease to be admired by those who, uninfluenced by fashion, have taste enough to appreciate what is at once original, simple, and beautiful. His Twelve Ballads are lovely melodies, but being in the style of 'the days that are gone,' have fallen into the neglected state of many other excellent English compositions; to be however as surely revived as were the works of Purcell, after they had slumbered long years in damp closets or on dusty shelves. His madrigal 'Let me careless and unthoughtful lying' (one of Cowley's Fragments), a work which certainly has no superior, if a single equal, of the sort, is still heard at the Antient Concerts, the Catch and Glee Clubs, and wherever really fine vocal harmony—music of the enduring kind—is cultivated or promoted.

Mr. Sheridan's political and social engagements having occupied a large portion of the time which, in prudence, ought to have been devoted to the theatre, the management of its details fell much on Mr. Linley; and herein he derived great assistance from his wife, a lady of strong mind and active habits, by whose care the pecuniary affairs of that vast concern were well regulated, so long as she had any control over them.

Mr. Linley survived his two accomplished daughters and several of his other children. But some years previous to their decease he suffered a shock by the loss of his eldest son Thomas, who was drowned by the upsetting of a boat while on a visit to the duke of Ancaster, in Lincolnshire, from which and his subsequent bereavements his mind never entirely recovered. This young man, who had just reached his twenty-second year, possessed genius of a superior order. His musical education was as perfect as his father's and Dr. Boyce's instructions and those of the best masters of Italy and Germany could render it, and he had given decided proofs of its efficiency when the fatal accident occurred. None out of his own family more lamented the event than his friend the celebrated Mozart, with whom he had lived on the Continent in the closest intimacy, and who always continued to mention him in terms of affection and admiration. Mr. Linley died in 1795, leaving a widow, a daughter, and two sons, of whom

LINLEY, WILLIAM, born about the year 1767, and educated at Harrow and St. Paul's schools, was the younger. Mr. Fox appointed him to a writership at Madras, and he soon rose to the responsible situations of paymaster at Vellore and sub-treasurer at Fort St. George. He returned from India early, with an easy independence, and devoted the remainder of his life partly to literary pursuits, but chiefly to music, of which he was passionately fond, a talent for the art coming to him as it were by inheritance. He produced a considerable number of glees, all of them evincing great originality of thought and refined taste, some of which will make him known to posterity, along with others who have most distinguished themselves in this charming and truly national kind of music. Mr. W. Linley also published, at various periods, a set of Songs, two sets of Canzonets, together with many detached pieces. He was likewise the compiler of the 'Dramatic Songs of Shakspeare,' in two folio volumes, a work of much research and great judgment, in which are several of his own elegant and sensible compositions. Early in life he wrote two comic operas, which were performed at Drury-lane theatre; also two novels, and several short pieces of poetry. He likewise produced an elegy on the death of his sister Mrs. Sheridan, part of which is printed in Moore's 'Life of Richard Brinsley Sheridan.' This last survivor of the Linley family died in 1835.

LINLITHGOW, or WEST LOTHIAN, is a small county of Scotland, bounded on the north by the Frith of Forth, on the west, south-west, and north-west by the shires of Stirling and Lanark, and on the south and south-east by Edinburghshire, from which it is separated by the rivers Breich and Amond. Its greatest length, from the mouth of the Amond to the borders of Stirling and Lanarkshire, is nearly 21 miles; and its greatest breadth, from the north-west extremity of the county to the village of Livingston, on the south-east, somewhat exceeds 10 miles: it is comprised between 55° 51′ and 56° 1′ N. lat., and 3° 17′ and 3° 50′ W. long.

In 1794 Mr. Trotter estimated the area of the county and the distribution of the soil as under:—

	Scotch Acres.
Good clay lands . . .	14,000
Loam	7,000
Light gravel and sand . .	7,000
Clay, cold, wet and hard bottom .	18,000
High rocky land . . .	10,000
Moss	1,008
	57,008

or about 71,260 English statute acres, which is probably rather less than the true area. Mr. M'Culloch estimates it at 76,800 statute acres, or 112 square miles.

The surface is pleasantly diversified by hills and valleys, and intersected by numerous rivulets or burns, but there are no streams which merit the appellation of rivers, excepting the Avon and Amond, and even these are small, and belong as much to the shires of Stirling and Edinburgh as to that of Linlithgow. No fish, beyond a few fresh-water trout, are found in them; but the two lochs in the vicinity of the town of Linlithgow are well stocked with pike. The Unio

Canal, which connects the city of Edinburgh with the Forth and Clyde Canal, crosses the county, passing a little to the south of the town of Linlithgow. The high-roads are kept in good repair by means of tolls; the cross-roads are less complete.

Coal is abundant and extensively worked, more particularly at Borrowstounness, where the mines extend nearly a mile beneath the bed of the Frith, so as almost to meet those of Culross on the opposite bank, which extend in a southerly direction to the distance of two miles. There is also an abundance of limestone and freestone, besides several quarries of excellent granite, and among the Bathgate Hills lead-mines were formerly wrought with great advantage, but they are now supposed to be exhausted.

The system of agriculture is nearly the same as that of the adjoining county of Edinburgh, with the exception that more attention is paid to the cultivation of turnips. The rotation of crops most frequently adopted upon clay soils is: 1st year, summer fallow; 2nd, wheat; 3rd, beans and pease; 4th, barley; 5th, clover and rye-grass for hay; 6th, oats; 7th, summer fallow, &c. The dung of the farm-yard constitutes the chief manure; but lime, which is very plentiful in several parts of the county, is also much used. Due attention is paid to the thorough draining of the soil, and most of the arable lands are enclosed with substantial fences, and the greater part of the waste lands are planted with several kinds of timber. The climate, though cold, is considerably tempered by the winds which prevail from the south-west, and the county suffers much less from the severity of the weather than from sudden changes. The hay harvest usually commences about the second week in July, and in ordinary years the corn is all in by the end of October. The farms are of a medium size, and the leases are mostly granted for terms of 19 or 21 years, though in some instances they extend to 24, 38, and even 57 years. Formerly it was the custom not to renew a lease till within a few months of the time of giving up possession, which in many instances induced the tenant to take every advantage of the farm for the sake of immediate profit; and we are not sure that this practice, so obviously prejudicial to the interest of the proprietor, has yet been altogether discontinued. The average rent of land in 1810 was 21*s.* 7*d.* the imperial acre, and in 1815 the annual value of the real property of the county, which is less divided than in other parts of Scotland, was 97,597*l.* The cotton manufactures employ from 700 to 800 hands.

The county is divided into thirteen parishes, the united population of which, in 1831, was 23,291, namely, 10,995 males and 12,296 females, which were distributed among 5014 families, of whom 1093 were engaged in agriculture, and 1891 in trade, manufactures, and handicraft. The county returns one member to parliament.

The following table, exhibiting the state of the several parochial schools in the year 1825, is compiled from parliamentary papers relative to the parochial education of Scotland. It does not include the private schools, which are numerous and tolerably well supported:—

Parish.	Salary and Emolument of Schoolmaster in the Year 1825.	School Fees per Quarter in the Year 1825, and the Branches of Education then taught.	Average Number of Scholars.
Abercorn . .	£56 10 2	English, writing, arithmetic, Latin, and Greek, 8*s.* . .	70
Bathgate . . .	102 0 0	Greek, Latin, French, geography, English grammar, and mathematics. Fees unknown	460
Borrowstounness	82 0 0	Ditto, ditto. Fees 18*s.* . .	80
Carriden . . .	11 4 11	English, writing, and arithmetic, 5*s.*	28
Dalmeny . . .	60 14 10	Ditto, ditto, and Latin, 5*s.* 6*d.* .	70
Ecclesmachan .	£16—£20	Reading, writing, and arithmetic, 3*s.*	40—50
Kirkliston . .	400 merks Scotch, with £50—£60	English, writing, arithmetic, and Latin, 5*s.* 6*d.* . .	60—70
Linlithgow . .	Unknown.	English, writing, arithmetic, French, and Latin, 9*s.* . .	90—100
Livingston . .	£42 4 5	English grammar, writing, and arithmetic, 5*s.* . . .	50
Queensferry . .	76 14 10	English, French, Latin, Greek, and mathematics, 14*s.* . .	129
Torphichen . .	38 0 0	English, writing, and arithmetic, 3*s.*	76
Uphall . . .	400 merks Scotch, and £25	Ditto, ditto	70
Whitburn . .	£38—£40	English and writing, 2*s.* . .	50

The principal towns are Linlithgow, Bathgate, and Borrowstounness. [BATHGATE.]

LINLITHGOW, the county town, and a royal burgh of considerable antiquity, is sixteen miles west by north from Edinburgh. The earliest charter upon record is that of Robert II., dated 23rd October, 1389. To this succeeded the charters of James II. (1451-4), James III. (1465), James V. (1540), James VI. (1580, 1591, and 1593), and Charles I. (11 July, 1633), whereby various privileges were conferred upon the town. The magistracy is composed of a provost, 4 baillies, dean of guild and treasurer, who are elected from the 27 common-councillors, in conformity with 3 and 4 Will. IV., c. 76. The debt of the burgh is considerable, though less than in former years. In 1692 the magistrates reported that they owed 18,235*l.* Scots, or about 1520*l.* sterling; but in 1835 it had increased to 8141*l.* sterling. The revenue, derived principally from landed property and town-dues, amounted in the last-mentioned year to 710*l.*, which was exceeded by the expenditure. The town is paved, well lighted with gas, and tolerably clean. It is likewise well supplied with water, but not protected by an efficient police. The population in 1831 was 4874.

The burgh school is said to be ably conducted. The two teachers are appointed by the town-council, after undergoing an examination by the professor of Latin or the rector of the high school of Edinburgh. Linlithgow unites with Lanark, Peebles, and Selkirk, in returning one member to parliament. The chief antiquity in this place is the palace of Linlithgow, which, after being a royal residence for several centuries, was accidentally set on fire in the year 1746, and is now a magnificent ruin. In the palace chapel is still shown the aisle where an apparition is said to have warned James IV. of the impending issue of the battle of Flodden.

Borrowstounness is an incorporated seaport-town, 17 miles west by north from Edinburgh. Here are extensive salt-works, the produce of which is supposed to exceed 30,000 bushels annually. There is also a little ship-building carried on, and some trade with the Baltic in tallow, hemp, &c.; but during the season a considerable portion of the inhabitants are engaged in the herring-fishery. The harbour is considered safe and commodious, and, with a view to effect its improvement, an act was passed in 1744 (17 Geo. II.), whereby an impost of 2*d.* Scots is levied on every Scotch pint of ale or beer brought into the town. The depth of water in spring-tides is about 18 feet. The revenue, consisting principally of harbour-dues, amounted in 1836 to 216*l.*, which was insufficient to defray the ordinary disbursements for keeping the harbour and town in repair, and paying the interest of a debt which had then accumulated to 2030*l.* The population in 1831 was 2809.

(Trotter's *General View of the Agriculture of West Lothian*, 4to., 1794; M'Culloch's *Statistical Account of the British Empire*; *Local Reports from Commissioners on Scotch Corporations*, 1835-36; *Beauties of Scotland*; Sinclair's *Statistical Account of Scotland*.)

LINNÆUS, or VON LINNE', CARL, was born at Råshult, in the province of Smaland, in Sweden, May 13, 1707 (O.S.). His father, Nicholas Linnæus, was the assistant clergyman of a small village called Stendrohult, of which Råshult was a hamlet, and is related to have resided in a 'delightful spot, on the banks of a fine lake, surrounded by hills and valleys, woods and cultivated ground,' where it is believed that the son imbibed in his earliest youth a fondness for the objects of animated nature. His maternal uncle too, who educated him, is said to have been conversant in plants and horticulture; and thus, according to the declaration of Linnæus himself, he was at once transferred from his cradle to a garden. The father seems to have himself had some acquaintance with botany, and to have instructed his boy at a very early age in the names of the natural objects which surrounded them. Linnæus however is said to have had little taste for remembering names, and his father found it no easy matter to overcome this inaptitude; he however at last succeeded, and the consequence was sufficiently conspicuous in the decided turn for nomenclature which the mind of the pupil eventually took. Whether in the next stages of learning Linnæus was ill-managed, as he himself thought, or whether the nature of his education at home had rendered him indisposed for drier and severer studies, it is certain that his preceptors found great cause to complain of him, and pronounced him, at the age of nineteen, if not a positive blockhead, at all events unfit for the church, for which he was intended: they in fact recommended him to be apprenticed to some handicraft trade. The schoolmaster at Wexio, who pronounced this unfortunate judgment, although designated by one of Linnæus's biographers as an 'iniquus doctor,' does not appear to have been so blameable for his opinion, however erroneous it afterwards proved; for Bishop Agardh admits that when, at the age of twenty, Linnæus arrived at the university of Lund, for the purpose of studying medicine, the profession finally determined upon for him, he was less known for his acquaintance with natural history than for his ignorance of everything else.

Matriculated at Lund, Linnæus was so fortunate as to be received into the house of Dr. Stobæus, a physician possessing a fine library and a considerable knowledge of natural history. This amiable man was not slow to discover the signs of future greatness in his lodger; he gave him unrestrained access to his books, his collections, his table, and above all to his society, and would at last have adopted him for his son and heir. It was at this time that Linnæus first began to acquire a knowledge of what had been already written upon natural history, to gain an insight into the value of collections, to extend his ideas by the study of the comparatively rich Flora of his alma mater, and above all things to enjoy the inestimable advantage of having an experienced friend upon whose judgment he could rely. The year 1727-8, and the house of Stobæus, were beyond all doubt the time and place when Linnæus first formed that fixed determination of devoting himself to the study of natural history, which neither poverty nor misery was afterwards able to shake. In the year 1728 he passed the vacation at home, and there formed the resolution of prosecuting his future studies at Upsal—a measure which for the time lost him the good-will of his patron Stobæus. For the purpose of meeting the expenses of his academical education, his father was unable to allow him a larger annual sum than 8*l.* sterling; and with this miserable stipend he had the courage to plunge into the world. Nothing less than the most biting poverty could be the immediate result of such a measure; and we accordingly find Linnæus, for some time after this, in a state of miserable destitution, mending his shoes with folds of paper, trusting to chance for a meal, and in vain endeavouring to increase his income by procuring private pupils. No succour could be obtained from home, and it is difficult to conceive how he should have struggled with his penury without the slender aid afforded by a royal scholarship, awarded him on the 16th of Dec. 1728. Nevertheless he diligently persevered in attendance upon the courses of lectures connected with his future profession—the more diligently perhaps because of his poverty; and by the end of 1729 the clouds of adversity began to disperse. By this time he had become known to Dr. Olaus Celsius, the professor of divinity at Upsal, who was glad to avail himself of the assistance of Linnæus in preparing a work illustrating the plants mentioned in the Holy Scriptures. His new friend procured him private pupils, and introduced him to the acquaintance of Rudbeck, the professor of botany, then growing old, who appointed him his deputy lecturer, took him into his house as tutor to his younger children, and gave him free access to a very fine library and collection of drawings.

Here the published writings of Linnæus were commenced; it was in the midst of the library of Rudbeck that he began to sketch those works, which were afterwards published under the titles of 'Bibliotheca Botanica,' 'Classes Plantarum,' 'Critica Botanica,' and 'Genera Plantarum;' and to perceive the importance of reducing into brevity and order the unmethodical, barbarous, confused, and prolix writings with which he was surrounded. If, in the prosecution of a task of such imminent necessity, he fell into the opposite errors of attempting to make the language of natural history more precise than is possible from the nature of things, of reducing the technical characters of species and genera to a brevity which often proved a nullity, and of reforming the terminology till it became pedantic, there is no candid person who will not be ready to acknowledge that such errors were of no importance whatever when compared with the great good which the writings of Linnæus upon the whole effected. In the year 1731 Linnæus quitted the house of Rudbeck, and on the 12th of May, 1732, proceeded, under royal authority and at the expense of the university of Upsal, upon his celebrated journey into Lapland. On horseback and on foot he accomplished his object by the 10th of October following, when he returned to Upsal, after travelling, alone and slenderly provided, over nearly 4000 miles. The result of this expedition has been given in his excellent 'Flora Lapponica,' and in the Swedish account of his tour, of which an English translation was published some years since. For some time after his return we find him occupied in teaching mineralogy, particularly the art of assaying, persecuted by the miserable jealousy of a certain Dr. Rosen, on whom he is said to have drawn his sword, and travelling in Dalecarlia at the expense of the governor. In the beginning of 1735 he had scraped together 15*l.*, with which he set out upon his travels in search of some university where he could obtain the degree of doctor in medicine the cheapest, in order that he might be able to practise physic for a livelihood. At Harderwijk, in Holland, he accomplished his purpose, June 23, 1735, on which occasion he defended the hypothesis that 'intermittent fevers are owing to fine particles of clay taken in with the food, and lodged in the terminations of the arterial system.'

In Holland Linnæus formed a friendship with Dr. John Burmann, professor of botany at Amsterdam, and it was during his stay of some months with that botanist that he printed his 'Fundamenta Botanica,' a small octavo of thirty-six pages, which is one of the most philosophical of his writings. At that time he was introduced to Mr. George Cliffort, a wealthy Dutch banker, possessing a fine garden and library at a place called Hartecamp. This gentleman embraced the opportunity of putting it under the charge of Linnæus, who continued to hold the appointment till the end of 1737, during which time he is said to have been treated with princely munificence by his new patron. His scientific occupations consisted in putting in order the objects of natural history contained in Mr. Cliffort's museum, in examining and arranging the plants in his garden and herbarium, in passing through the press the 'Flora Lapponica,' 'Genera Plantarum,' 'Critica Botanica,' and some other works, and in the publication of the 'Hortus Cliffortianus,' a fine book in folio, full of the learning of the day, ornamented with plates, and executed at the cost of Mr. Cliffort, who gave it away to his friends. Some idea may be formed of the energy and industry of Linnæus, and of his very intimate acquaintance with botany at this period of his life, by the fact that the book just mentioned, consisting to a great extent of synonyms, all the references to which had to be verified, was prepared at the rate of four sheets a week, a prodigious effort considering the nature of the work, which Linnæus might well call 'res ponderosa.' He however seems to have possessed powers of application quite beyond those of ordinary men; and to have worked day and night at his favourite pursuits. In May, 1737, he speaks of his occupations as consisting of keeping two works going at Amsterdam, one of which was the 'Hortus Cliffortianus,' already mentioned; another at Leyden, a fourth in preparation; the daily engagement of arranging the garden, describing plants, and superintending the artists employed in making drawings, which alone he calls 'labor immensus et inexhaustus.' (Van Hall, p. 12.) Linnæus however seems to have been weary of the life he led at Hartecamp, and towards the end of 1737 he quitted Mr. Cliffort under the plea of ill health, and an unwillingness to expose himself again to the autumnal air of Holland. These however seem to have been only excuses, for he did not really quit the country before the spring of 1738, and in fact he was evidently tired of his drudgery; good Mr. Cliffort would scarcely allow him to leave the house, where Linnæus complains of being 'incarceratus monachi instar cum duabus nunnis.' It was during his engagement at Hartecamp that he visited England, where he seems to have been disappointed both at his reception and the collections of natural history which he found here. He was ill received by Dillenius, at that time professor of botany at Oxford, who was offended at the liberties Linnæus had taken with some of his genera; and although the quarrel was made up before his return to Holland, it seems to have discomposed the Swedish naturalist not a little. He describes the celebrated collection of plants formed by Sherard at Eltham as being unrivalled in European species, but of little moment in exotics: he found the Oxfor garden in a like condition, but with the greenhouses stoves empty; and the great collection of Sir Hans Sl in a state of deplorable confusion and neglect. Dr.

the traveller in the Levant, seems to have pleased him most, and he, together with Philip Miller, the celebrated gardener to the Society of Apothecaries, Mr. Peter Collinson, and Professor Martyn the elder, were apparently the only acquaintances Linnæus succeeded in forming. By this means he acquired a considerable addition to his collections of plants and books. While in Holland he also induced Professor Burmann, in conjunction with five printers, to undertake the publication of Rumphius's important 'Herbarium Amboinense,' at an estimated cost of 30,000 florins.

Upon his return to Sweden he commenced practice in Stockholm as a physician, and with the aid of a pension of 200 ducats from the government, on condition of lecturing publicly in botany and mineralogy, his prospects for the future became so satisfactory as to enable him to marry at Midsummer, 1739. By this time his botanical fame had spread over all Europe; the importance of the critical improvements he had introduced into this and other departments of natural history had become generally acknowledged, and his new method of arranging plants by the differences in their stamens and pistils had been adopted in many countries, but not in Sweden. Impatient at receiving less honour in his own country than elsewhere, he wrote a book called 'Hortus Agerumensis,' arranged according to his system, which hepassed off upon Rudbeck, at that time professor of botany at Upsal, as the production of his friend Rothmann, who however had no further hand in it than that of writing the preface, which was an eulogium of Linnæus and his new system of botany. The book was eventually published under the name of Ferber, and accomplished the object of the contrivers, for afterwards no other botanical arrangement was received in Sweden.

From this time forwards the life of Linnæus was one of increasing fame and prosperity. Every branch of natural history was revised or remodelled by him; books and collections were sent to him from all parts of the world; his pupils Hasselquist, Osbeck, Sparmann, Thunberg, Kalm, Lofling, and others, communicated to him the result of their travels in Europe, Asia, Africa, and America. He was named professor of medicine at Upsal in 1740, and afterwards of botany; in 1746 he received the rank and title of archiater; in 1757 he was raised to the nobility, and took the title of Von Linné, and by the year 1758 he was able to purchase the estates of Hammarley and Söfja for 80,000 Swedish dollars, above 2330*l.* sterling.

During these eighteen years his life was one of incessant labour; besides his practice as a physician, which was extensive and lucrative, and his duties as professor, he published a most extraordinary number of works on various branches of natural history. His works upon other branches of natural history were less important than those on botany, but they all evinced the same ingenuity in classification, and that logical precision which has rendered the writings of Linnæus so generally admired. In addition to a large number of dissertations, bearing the names of his pupils, and now collected under the title of 'Amœnitates Academicæ,' the 'Flora,' and 'Fauna Suecica,' 'Materia Medica,' edition after edition of the 'Systema Naturæ,' and numerous miscellaneous works, some of great importance, he produced his 'Philosophia Botanica,' and 'Species Plantarum.' The former, dictated from a sick bed, was the best introduction to botany that had been written, and is far superior to the numerous dilutions of it which subsequently appeared from the pens of his followers. The latter contributed more than any work which had before been seen to place the existing knowledge of plants in a clear and intelligible form; the invention of generic and specific names, by which every known plant could be spoken of in two words, was in itself a great step towards securing order and perspicuity in future botanical writings, and the methodical and concise arrangement of references rendered it invaluable, notwithstanding its omissions, as a catalogue of the plants at that time known. Viewed with reference to the existing state of knowledge, this book deserves all the praise which has been given it; and botanists have, as if by common consent, taken the second edition, which appeared in 1762, as the point of departure for systematic nomenclature. So great is the importance still attached to it, that an edition, chiefly consisting of it and the 'Genera Plantarum,' incorporated in the state in which they were left by Linnæus, has nearly passed through the press under the name of '**Codex Botanicus Linnæauus,' collated by Dr. Hermann Eberhard Richter.**

Towards the latter part of his life Linnæus suffered severely in health. Apoplexy succeeded repeated attacks of gout and gravel, and was followed in its turn by paralysis, which impaired his faculties, and at last he was carried off by an ulceration of the bladder, on the 10th of January, 1778, in the 71st year of his age. 'His remains were deposited in a vault near the west end of the cathedral at Upsal, where a monument of Swedish porphyry was erected by his pupils. His obsequies were performed in the most respectful manner by the whole university, the pall being supported by sixteen doctors of physic, all of whom had been his pupils.' A general mourning took place on the occasion at Upsal, and king Gustavus III. not only caused a medal to be struck expressive of the public loss, but introduced the subject into a speech from the throne, regarding the death of Linnæus as a national calamity.

In the article Botany we have already adverted to the effect produced by Linnæus upon that branch of science. His merit as a systematist is unquestionable; the clearness of his ideas, his love of science, his skill in abridging, abstracting, and recombining the undigested matter contained in the bulky tomes of his predecessors, and the tact with which he seized the prominent facts relating to all the subjects he investigated, enabled him to produce a complete revolution in botany, and to place it at a height from which it would never have descended had he been able to leave his genius and his knowledge to his followers. We by no means agree with those who look upon Linnæus as a mere namer of plants, for there is ample evidence in his writings that his mind soared far above the anility of verbal triflers: but he regarded exactness in language as a most important means to an end, especially in sciences of observation; and who is there to say that he was wrong? His systems of classification were excellent for the time when they were invented, although now worthless; and it is never to be forgotten that Linnæus regarded them merely as temporary contrivances for reducing into order the confusion he found in all branches of natural history. Perhaps he believed his sexual system of botany a near approach to perfection, and so it was as an artificial mode (and its great author regarded it as nothing more) of arranging the 6000 or 7000 species he was acquainted with; although it cannot be usefully applied to the vast multitudes of plants with which botanists are overwhelmed by the discoveries of modern travellers. He never attached the importance to it which has been insisted upon by his followers, who, unable to distinguish between the good and the evil of his works, have claimed unbounded respect for everything that bears the stamp of Linnæus. Neither are we disposed to admit the fairness of those critics who complain of the absence of physiological knowledge from the writings of Linnæus; it should be remembered that in his time very little was known upon the subject, and that of what did appear in the books of the day a great deal was not likely to attract the attention of a mind which valued exactness and precision above all other things. The most serious charge that Linnæus is open to is that of indecency in his language; some of his descriptions, it is asserted, 'would make the most abandoned person blush.' One of his greatest admires and panegyrists has added, 'None but the most abandoned.' We have no disposition to open up such a question as this, which is certainly not very fit for public discussion: but we are bound to say that there is truth in the allegation, and that the language of Linnæus is sometimes disgusting for its pruriency and coarseness.

The domestic life of Linnæus does not bear examination, for it is well known that he joined his wife, a profligate woman, in a cruel persecution of his eldest son, an amiable young man, who afterwards succeeded to his botanical chair. We may smile at the vanity which so often breaks out in the writings of Linnæus, and at the fidgetty anxiety for fame which induced him to make use of Rothmann as his trumpeter in the trick of the 'Hortus Agerumensis,' but such an act as that we have mentioned forms a stain upon his escutcheon which no talent, however exalted, can wipe out.

After the death of the younger Linnæus his library and herbarium were purchased for the sum of 1000*l.* by the late Sir James Edward (then Dr.) Smith, and are now in the possession of the Linnæan Society of London. The herbarium, contained in three small cases, is in good condition, and forms a most curious botanical antiquity, of great value as the means of ascertaining with certainty the synonyms of the writings of Linnæus. It has been very much used for this purpose by its late possessor, but we warn botanists against supposing that the identifications which have been published are to be depended upon.

(Pulteney's *Life of Linnæus*; Smith, in Rees's *Cyclopædia*: Van Hall's *Epistolæ Linnæi*; Agardh, *Antiquitates Linnæanæ*.)

LINNET, the name of a hard-billed singing bird, which though well known under one or the other of its various appellations to every English bird-catcher, has, in consequence of the changes of its plumage and the names applied to it when it appears under those changes, given rise to much confusion in our systems and catalogues, and considerable error among the learned as well as the unlearned. In endeavouring to place before the reader the state of the question, we shall, we fear, occupy more space than the title would, at first view, seem to warrant.

Mr. Selby, in his 'British Ornithology,' says of the 'common or brown linnet—*Fringilla cannabina*, Linn.': 'This bird has been considered by most of our authors as two distinct species, under the titles of the common or brown Linnet and the greater Redpole. This error has evidently arisen from the altered appearance it bears at particular ages, and during the different seasons of the year.* These changes in all probability had not been suspected, as they certainly had not been traced by the earlier naturalists; and, on the authority of their reputation, succeeding writers sanctioned such mistakes, without giving themselves the trouble of further investigation, till Montagu, who united practical research with scientific knowledge, professed (in the 'Ornithological Dictionary') his conviction of their forming one species; and my own observation and experiments tend to confirm his opinion.' Giving all due praise to Montagu and Mr. Selby for their diligence and acuteness in rectifying an error which seems to have been going on from the time of Willughby to the time of the publication of Bewick's 'Supplement,' we must say a word in favour of one of the fathers of Natural History at the revival of letters. A little investigation would have proved that of Bélon, at least, it cannot be said that the changes of plumage had not been suspected nor traced by him. That acute observer, in his *Histoire de la Nature des Oyseaux* (Paris, 1555), says, in his description of *La Linote*, or *Linotte*, 'Les Linotes ont la poictrine, et le dessus de la teste, grande partie de l'année, de couleur entre rouge et orengée: car elles ont lors la couleur si vive, qu'elle resemble à du sang: mais cela est seulement sur la fin du printemps;'—having previously described the more sombre state of plumage.

Willughby, whose 'Ornithology' was edited by Ray, and contains many observations by the latter, devotes a chapter (xi.) to the subject 'Of the Linnet.' The first section of the chapter is headed 'Of the Linnet in general,' and is as follows: 'The characteristic notes of this kind are, 1, a size of body something less than a chaffinch; 2, a testaceous or earthy colour, mixt of cinereous and dusky or brown; 3, a tail a little forked; 4, a peculiar colour of the outmost feathers of the tail, viz. brown, with white borders or edges; 5, a sweet note. Of linnets we have observed four sorts in England: 1. The common; 2. The greater red; 3. The lesser red; 4. The mountain linnet.' Here is probably the principal origin of the subsequent confusion. These four linnets are afterwards described and distinguished at length in the same chapter under the names of '*The common Linnet;* Linaria vulgaris.' '*The greater red-headed Linnet;* Linaria rubra major.' '*The lesser red-headed Linnet;* Linaria rubra minor.' '*The mountain Linnet;* Linaria montana.'

Bechstein, under his description of the common Linnet (*Fringilla cannabina*, Linn, *La Linotte*, Buff., *Der Hänfling*, Bechst.), states that, instructed by long experience and the observations of many years, he hopes to show in his description that the common Linnet (*Fringilla Linota*, Linn.†), the greater Redpole (*Fringilla cannabina*, Linn.), and, according to all appearance, the mountain Linnet (*Fringilla montana*, Linn.), are one and the same species. With regard to the identity of the two first-named species, ornithologists are now generally agreed; with regard to the last, the better opinion is against Bechstein, and in favour of the mountain Linnet being a distinct species.

M. Temminck, who observes (*Manuel d'Ornithologie*) that *Fringilla cannabina* and *Fringilla montium* have been often confounded, and that he has endeavoured to distinguish them by a small number of characters placed at the head of the short descriptions and of the synonyms, applies the same mode of distinction to *Fringillæ linaria* and *montium*, which he remarks have also been confounded. The short character given by him to his *Gros-bec Linotte* (*Fringilla cannabina*, Linn.), is, 'Bill short, of the width of the front, blackish; throat whitish, marked in the middle by some brown spots;' and he thus describes the various states of plumage, and the synonyms of the bird under each.

Old Male in the Spring.—Feathers of the front, of the breast, and of the lateral parts of the latter, of a crimson-red, terminated by a narrow border of rosy-red; throat and front of the neck whitish, with longitudinal brown markings; top of the head, nape, and sides of the neck, of a pure ash; back, scapulars, and wing-coverts, chesnut-brown; flanks, reddish-brown; middle of the belly and abdomen, white; some of the quills black, bordered externally with white; tail forked, black; the feathers edged externally with white and bordered internally by a large white space; iris, brown; bill, deep bluish; feet, ruddy-brown, more or less pale. Length, 5 inches.

Male, after the autumnal moult at the age of a full year.—On the top of the head large black spots; the back reddish, with spots of chesnut-brown, bordered with whitish-brown; breast, red ash-brown, or red-brown, with borders of whitish-red; brown spots well marked on the flanks, upper tail-coverts black, bordered internally with white and externally with greyish-red. (On raising the feathers of the front and those of the breast, the traces of the red colours which ornament the bird in the spring may be seen.)

In this state M. Temminck considers it to be *Fringilla Linota*, Gmelin; Latham, *Ind.*, v. 1, p. 457, sp. 81; *La Linotte ordinaire*, Buffon, *Ois.*, v. 4, p. 58, t. 1; Id., *Pl. Enl.* 151, f. 1; Gérard, *Tab. Elém.*, v. 1, p. 188; *Common Linnet*, Lath., *Syn.*, v. 3, p. 302.

The Female, which does not change colour after arriving at the adult state, is smaller than the male; all the upper parts are of an ashy-yellowish, sprinkled with blackish-brown spots; wing-coverts of a tarnished red-brown; lower parts bright reddish, but whitish on the middle of the belly, and sprinkled on the flanks with numerous blackish-brown spots.

Young males till the spring have the top of the head and the back reddish-brown, marked with deep brown lanceolate spots; cheeks and nape ashy; all the lower parts of a slightly reddish-white, marked on the middle of the throat and on the breast with longitudinal spots of a deep brown; large reddish-brown spots on the sides; and large lanceolate blackish spots on the coverts of the tail; feet flesh-colour; base of the bill livid-blue: it is then the bird given by Meyer, *Vög. Deutschl*, and by Frisch., *Vög.*, t. 9, f. A and B.

For the Old Birds, Male and Female, M. Temminck brings together the following synonyms and references:—*Fringilla cannabina*, Gmel., *Syst.* 1, p. 916, sp. 28; Lath., *Ind.*, v. 1, p. 458, sp. 82; Retz., *Faun. Suec.*, p. 247, No. 226; *La Grande Linotte de Vignes*, Buff., *Ois.*, v. 4, p. 58; Id., *Pl. Enl.* 485, f. 1 (the male putting on its plumage) and *Pl. Enl.* 151, f. 2 (the very old male, under the false name of *Petite Linotte de Vignes*); Id., *Pl. Enl.* 151, f. 1 (either a female, or, perhaps, a male in autumn); Gérard, *Tab. Elém*, v. 1, p. 190; *Greater Red-headed Linnet or Redpole*, Lath., *Syn.*, v. 3, p. 304; Id., *Supp.*, p. 176; *Bluthanfling*, Bechst., *Naturg. Deut.*, v. 3, p. 141; Id., *Tasschenb.*, p. 121; Meyer, *Tasschenb.*, v. 1, p. 163; Id., *Vög. Deut.*, v. 1, t., f. 1 and 2; Frisch., *Vög.*, t. 9, f. 1 and 2; Naum., *Vög.*, t. 5, f. 10 (old male), and f. 11 (female); Vlasvink, *Sepp. Nederl. Vög.*, v. 2, t., p. 157; *Montanello Maggiore*, *Stor. degl. Ucc.*, v. 3, pl. 357, f. 1.

In the third part of his 'Manuel' (1835) M. Temminck adds the following references and synonyms:—*Atlas du Manuel*, pl. lithog. (male); Vieill., *Faun. Franç.*, p. 77, pl. 38, *figs.* 2 and 3; Roux, *Ornit. Provenç.*, v. i., p. 148, tab. 91 (old male in the spring), and 92 (male in autumn); *Fichten und Busch Bluthänfling*, Brehm., *Vög. Deut.* p. 276; *La petite Linotte de Vignes*, Buff., *Pl. Enl.* 151, *fig.* 2 (male in moult); Naum., *Neue Ausg.*, tab. 121.

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* In the work itself the passage stands as follows; but, as there is an evident transposition of a line, we have given it as above. Original passage: 'This bird has been considered by most of our authors as Linnet and the Greater Redpole. This error has evidently two distinct species, under the titles of the Common or Brown, arisen from the altered appearance it bears at particular ages,' &c.

† It should be 'Gmelin.'

Returning to the two first parts of M. Temminck's 'Manuel' (2nd edit., 1820), we find him observing that the varieties of the young described by Meyer under the letter *c* and that under the letter *e* ought to be arranged under *Fringilla montium*.

M. Temminck remarks that this bird moults but once a year—in the autumn; but nevertheless the spring or nuptial plumage is of a beautiful red tint on the head and breast. He ascribes this to friction and the action of the air, which wear away the sombre and ashy borders of the feathers, and cause the red colour, partially hidden in winter under the ashy edges with which these feathers are terminated, to appear in the spring. He adds that one may conceive that age and the more or less distant time of moulting may vary this plumage greatly.

The reader however should not forget the changes of colour that Yarrell and others have shown to take place in the plumage of birds without change of feather, and where friction could hardly have been the agent.

Mr. Selby (1825), after the remarks already quoted, proceeds thus:—'Mr. Bewick however, in the Supplement to his work on British Birds, still continues to believe in the existence of two distinct species; for so we must understand him (although he has brought the synonyms of the two supposed species together), since in a note following the description and figure of his greater redpole, or brown linnet, he says that "it loses the red breast in autumn, and regains it in spring; in this it differs from the grey linnet, whose plumage remains the same at all seasons."' From his description of the Grey Linnet (the usual Northumbrian name of this bird), as given in the first volume of his work, it can be no other than the common or brown linnet of a particular age, although he has attached to it the Linnean synonymes of the lesser redpole. 'If,' continues Mr. Selby, 'Mr. Bewick's observations on the plumage of the linnet were made upon caged birds, I am not surprised at his assertion of its always retaining the same appearance; for I have repeatedly verified the fact of its never acquiring, under confinement, those brilliant tints which distinguish it at a particular period of the year when in a state of liberty. I will adduce one instance strikingly to the point in question. For some particular purpose of observation, a linnet was shot more than two years ago, towards the close of summer, when the plumage showed its most perfect nuptial tint; and, happening to be only winged, it was put into a cage, where it soon became familiarized to its situation, and still continues. About the usual time, in the autumn of that year, it moulted, and acquired the winter dress of the common linnet, which it has retained ever since, without displaying at the accustomed season any of the brilliant red that adorned it in the wild state.'

Mr. Selby, who gives in his great work the figures of a male bird in summer plumage, and of the nat. size (pl. 55, *fig.* 3), and of a female, nat. size (Ibid., *fig.* 4), collects the following synonyms for this species:—

Fringilla cannabina, Linn., *Syst.* i., p. 322, sp. 28.
Gros-bec Linotte, Temm., *Man. d'Ornith.*, v. i., p. 364.
Greater Redpole, or Brown Linnet, Mont., *Ornith. Dict.*
The Linnet, Low's *Faun. Orcad.*, p. 63.
Greater Redpole Finch, Shaw's *Zool.*, v. 9, p. 516.

Syn. of young male after 1st autumnal moult.	Fringilla Linota, Gmel., *Syst.* i., p. 916; Lath., *Ind. Ornith.*, v. 1, p. 457, sp. 81.
	Linaria, Raii, *Syn.*, p. 80, A. 1; Will., p. 190; Id. (Ang.), 258; Briss., 3, p. 131, 29.
	La Linotte ordinaire, Buff., *Ois.*, v. 4, p. 58, t. 1; Id., *Pl. Enl.*, 151, f. 1.
	Common Linnet, *Br. Zool.*, No. 130; Lewin's *Br. Birds*, 2, t. 83; Lath., *Syn.* 3, p. 402, 73; Pult., *Cat. Dorset.*, p. 12; Walc., *Syn.*, t. 221.
	Grey Linnet, Bewick's *Br. Birds.*, 1, p. 171

Syn. of adult male in summer plumage.	Fringilla cannabina, Gmel., *Syst.* 1, p. 916, sp. 28; Lath., *Ind. Ornith.*, v. 1, p. 458, sp. 82.
	Linaria rubra major, Briss., 3, p. 135, 30; Raii *Syn.*, p. 91, A. 2; Will., p. 191, t. 46.
	Le Grand Linotte des Vignes, Buff., *Ois.*, v. 4, p. 58; Id., *Pl. Enl.*, 485, f. 2, old male under the title of Petite Linotte des vignes.
Syn. of adult male in summer plumage.	Bluthanfling, Bechst., *Naturg. Deut.*, v. 3, p. 141; Id., *Tasschenb. Deut.*, v. 3, p. 141; Id., *Tasschenb. Deut.*, p. 121; Meyer, *Tasschenb. Deut.*, v. 1, p. 163; Id., *Vög. Deut.*, v. 1, f 1 and 2; Frisch., *Vög.*, t. 9, f. 1 and 2.
	Greater Redpole or Red-headed Linnet, *Br. Zool.*, 1, No. 131, t. 54; *Arct. Zool.*, 2, No. 161; Will. (Ang.), 260; Lewin's *Br. Birds*, 2, t. 84; Lath., *Syn.* 3, p. 304; Id., *Sup.*, p. 167; Walc., *Syn.* 2, t. 222; Pult., *Cat. Dorset.*, p. 12; Bewick's *Br. Birds.*, v. 1, t., p. 173; Id., *Sup.*, p., t. 22.

Mr. Gould, in his beautiful work on the Birds of Europe, figures a male in the spring or nuptial plumage, and a female of the nat. size, under the name of *Linaria cannabina, Le Gros-bec Linotte, Common or Brown Linnet*, and refers to Mr. Selby principally for the account of the changes of plumage. He also notices the confusion which formerly obtained about this species.

Varieties.—M. Temminck states that the bird varies accidentally to pure white; whitish, with the wings and tail as they are ordinarily; the colours feebly traced on the plumage; a part of the body white, or variegated with white feathers. All the plumage blackish, or more sombre than ordinary; the feet often red. He says that it is then *Fringilla Argentoratensis*, Gmel., *Syst.*, 1, p. 918, sp. 69; Lath., *Ind.*, v. 1, p. 460, sp. 87; *Le Gentyl de Strasbourg*, Buff., *Ois.*, v. 4, p. 73; Gérard, *Tab. élém*, v. 1, p. 194.

Geographical Distribution.—Very abundant in Holland. (Temm.) Very common throughout Britain, extending as far as to the Orkneys, where it is abundant. (Selby.) Indigenous to the British Islands, over the whole of which, and Europe generally, it is plentifully dispersed. (Gould.) Erzeroum in Persia. (Keith, Abbott.)

Habits, Food, Propagation.—In Britain resorting to waste lands and commons in the upper parts of the country, where it breeds. Assembling in winter in very large flocks, and descending to the sea-coasts, where these birds remain till pairing time stimulates them to seek the uplands. The food of the linnet consists of small seeds generally; those of the cruciform plants are favourites. The *nest* is built in a low bush, most frequently in furze, of moss and stalks of grass interwoven with wool, and lined with hair and feathers: *eggs*, 4 or 5, bluish-white dotted with purplish-red. (Selby principally.)

The bird is provincially termed Greater Redpole, Rose Linnet, Grey Linnet, Lintwhite, and Lintie. Bélon is of opinion that this species is the bird named *Salus* by the Latins, and Αἰγίθως (Ægithus) by Aristotle, in the fifteenth chapter of his nineteenth book ('Hist. Anim.'). The French and German names have been given above. It is the *Fanello* of the modern Italians, and *Llinos* and *Llinos bengoch* of the antient British.

The common Linnet is prized for its sweet song, and has been taught to imitate the human voice. The Hon. Daines Barrington mentions the celebrated talking Linnet at Kensington. He heard it repeat the words 'Pretty boy.'

Our limits will only permit a cursory notice of the other species generally considered as Linnets.

The Rev. Leonard Jenyns, in his 'Manual of British Vertebrata' (1835), makes the genus *Linaria* (Steph.) consist of *F. Linaria*, Linn. (Lesser Redpole); *F. cannabina*, Linn. (*Common Linnet;* Common or Brown Linnet of Selby, and Greater Redpole and Linnet of Montagu's 'Ornith. Dict.'); and *F. Montium*, Gmel. (*Mountain Linnet*).

Mr. Gould, in his 'Birds of Europe,' gives the following species of the genus *Linaria* of authors, in addition to the Common or Brown Linnet above noticed: *Linaria montana, Mountain Linnet*, or *Twite; Linaria canescens, Mealy Redpole;* and *Linaria minor, Lesser Redpole.*

The *Mountain Linnet* occurs in the catalogue given by M. Temminck, on the authority of Dr. Von Siebold and M. Burger, of European species of birds found in Japan, where it is known by the name of *Zuzume*. This is the *Gros-bec à gorge rouge, ou de montagne* of M. Temminck, and *Llinos fynydd* of the antient British.

The *Green Grosbeak* or *Greenfinch* (*Y Gegid, Llinos werdd* of the antient British) is sometimes called the *Green Linnet*. (FRINGILLIDÆ, vol. x.; GREENFINCH, vol. xi.)

LINSEED (*Graine de Lin*, French; *Leinsaat*, German; *Lynzaad*, Dutch; *Linaza*, Spanish; *Linhaca*, Portuguese; *Linseme*, Italian; *Semjalenjanve*, Russian), the seed of the Lin, Linum, or flax plant, is a valuable product derived from the capsules of Linum usitatissimum, and consisting of small greyish-brown lenticular bodies, containing a mealy albumen, of so oleaginous a nature, that it yields by pressure in great abundance the oil of linseed. The seed of the flax-plant is harvested not merely with a view to the reproduction of the plant, but also because of the oil which it yields by compression. For both these purposes, of sowing and crushing, linseed is largely imported into the United Kingdom. Linseed is also much used as food for small birds. The importations during each of the last ten years have been:—

1828	. 1,996,414 bushels.	1833	. 2,179,135 bushels.
1829	. 2,052,258 „	1834	. 2,210,237 „
1830	. 1,990,971 „	1835	. 2,206,748 „
1831	. 2,759,103 „	1836	. 3,339,215 „
1832	. 1,995,072 „	1837	. 3,321,089 „

The principal part of these importations is from Russia; the quantities brought from that country in each of the last three years were 1,534,073, 2,109,530, and 2,432,654 bushels respectively, being very nearly seven-tenths of the whole importations. The remainder is received from other countries in the north of Europe, and principally from Prussia and Holland; from Italy, Turkey, and the United States of America; and within the last three years some shipments have been received from the territories of the East India Company. About one-fifth of the whole importation goes to Ireland, and is chiefly used for sowing. The best seed for this purpose is brought from Holland. The residuum of linseed from which the oil has been expressed is used, under the name of oil-cake, for fattening cattle. The duty paid on the importation of linseed into this country is 1½*d.* per bushel, and the price in our markets is usually from 46*s.* to 55*s.* per quarter of eight bushels. [Flax.]

LINSEED-OIL may be procured by cold expression of the seeds, a process which makes the oil clearer; or the bruised seeds are roasted in the oil-mills, in which case it is brownish-yellow, and easily becomes rancid, probably from attracting oxygen. Linseed-oil is pellucid, with a faint but peculiar odour and taste, generally disagreeable, from being subrancid. Specific gravity 0·93. It easily dries: by reduction of temperature it merely becomes cloudy, but scarcely freezes.

It may easily be purified by repeated agitation with water, by bleaching in the sun, or, better, by filtering it through newly prepared charcoal.

By long boiling it becomes dark-brown, tenacious, and thickened, but dries more easily, and in this state is used for printers' ink; by still longer boiling it becomes black, almost solid, and elastically tenacious, like caoutchouc, and in this state it serves for bird-lime.

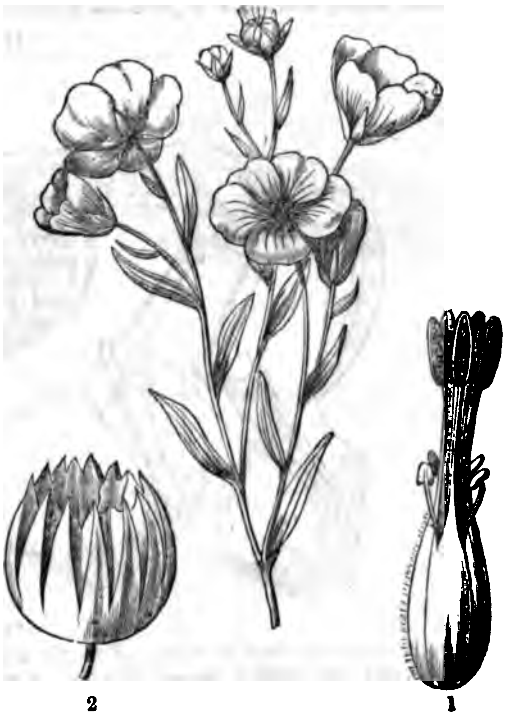
By the addition of nitrous acid it becomes thick and red, then dark reddish-brown, like tincture of iodine, but does not become solid. It is frequently adulterated with rape-oil, which may be detected by this test. Neither does it form elaidin, as rape-oil does. But a simpler test is, that if wood be besmeared with oil which has been adulterated, it does not become dry.

Linseed-oil is used to form liniments, of which the most common is that with lime-water, as an application to burns. But it is much more extensively used in the arts, particularly for painting.

LI'NTHURIS. [Foraminifera, vol. x., p. 348.]

LINU'CHIA. Eschscholtz gave this generic name to certain forms of the Linnæan genus Medusa. ('Actinologie,' p. 289.)

LINUM, a genus of plants which gives its name to the small family of *Linaceæ*, and is characterized by having five distinct sepals, five petals, five stamens, and from three to five styles, which are either distinct from the base, or united as far as the middle, or even the apex. Capsule globular, divided into ten cells, each containing a single seed. Herbs or small shrubs; leaves entire, without stipules; flowers having the petals falling off shortly after flowering. The species are chiefly found in Europe and the north of Africa, but a few likewise in other parts of the world. Few however are of any importance, except that which has been an object of culture from the earliest times of which we have any record, that is *Linum usitatissimum*, or the flax-plant, which is valuable as well for its seed, as for the ligneous fibre of its cortical layer, which forms the tow spun into yarn and woven into linen cloth. [Flax; Linen.] It has been sometimes said that cotton is the substance from which cloth was made in Egypt in antient times. Cotton was no doubt known to the Hindus at very early periods, and may have formed an article of commerce to Egypt from India, but that it was not much used is proved by none of the mummy cloth, which has been examined by the best microscopes, being found to be composed of cotton. The seed is valuable for the condensed mucilage contained in its seed-coats, while the almond contains a fixed oil, valuable for burning, and in the arts as a drying oil; the oil-cake is used for fattening cattle. Linseed is extensively imported from Russia, Italy, and Egypt, for crushing, but of late years it has been imported in large quantities from India for the same purpose; this is found to yield a larger proportion of oil than Russian linseed, and the commerce will no doubt continue to increase. Seed is also imported from Holland, America, and other places for the purpose of sowing, as it is found to yield a finer and more abundant crop than the British seed. It is curious that the Hindus make no use of the ligneous fibre; but the plants, though they there produce fine seed rich in oil, are very dwarfish, and may not therefore be found profitable culture for a people who have cotton in such abundance, and who wove it into cloth in ages when even linen was unknown in Europe.



Linum usitatissimum.

1, the mouadelphous stamens, highly magnified; 2, the ripe capsule, split at its end into valves.

LINUM USITATI'SSIMUM, *Medical Properties of.* The seeds of this plant yield several articles useful in medicine and surgery. The testa, or husk of the seeds, is very mucilaginous, the kernel contains much oil, and the farina or meal, procured by grinding or bruising the seeds, after the oil has been expressed, furnishes an excellent material for poultices. [Cataplasms.] The seeds are oblongo-ovate, acute, compressed, brown, shining, very smooth, the skin thin, the kernel white and oily. They are devoid of odour, but have an unpleasant mucilaginous oily taste. Old, rancid, and corroded seeds should be rejected. One part of seeds and two parts of water yield a strong mucilage. It is much better to obtain the mucilage by merely pouring cold water on the entire seeds, than to bruise them and pour boiling water on them, as generally directed. The mucilage is analogous to that of the quince seed [Cydonia], and differs in its chemical habitudes, in several respects.

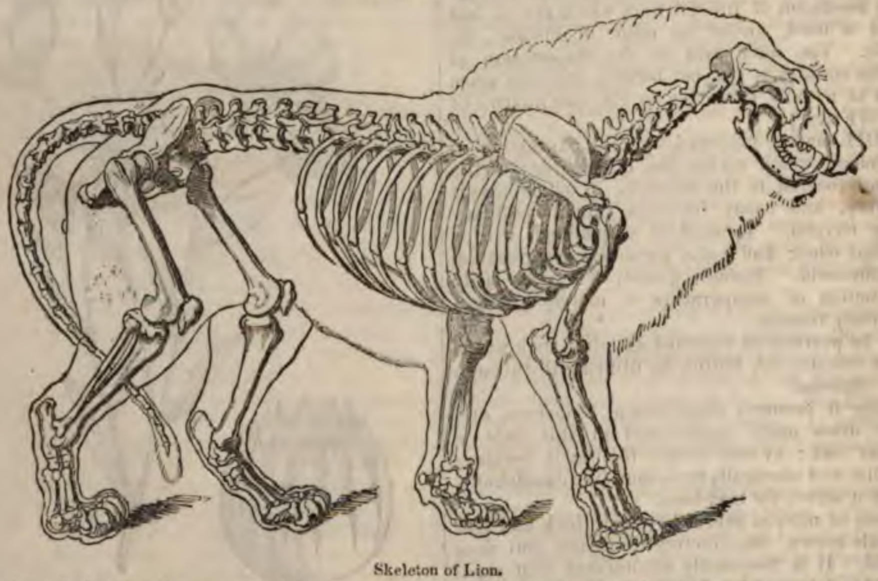
from common gum. The compound infusion of linseed is demulcent, and the unpleasant taste may be much lessened by using cold water to form it, as stated above. The farina of the seeds, ground before the oil has been expressed, furnishes the best material for poultices, but does not keep well. The cake remaining after the expression of the oil is much used to fatten cattle, but gives a peculiar taste to the meat.

The lint, or charpie, used by surgeons to dress ulcers, &c., should always be prepared from linen-cloth and never from cotton, as an essential difference exists in the nature of their fibres, which causes that of cotton to prove extremely irritating.

LINZ, the capital of Upper Austria, in 48° 19′ N. lat. and 14° 17′ E. long., is agreeably situated at the junction of the Traun and the Danube, over which latter river there is a wooden bridge 864 feet long. It is divided into four sections, viz. the town and the three suburbs. The old town consists of one long street, and is of much less extent than the suburbs. There are four gates and three squares, in the largest of which there is 'the Pillar of the Trinity,' erected by the Emperor Charles VI. in 1723, and also two fountains. It is on the whole well built, for which it is not a little indebted to several fires, after which the parts destroyed have been always much improved; this was especially the case after a very great fire in 1800, which consumed the county hall, the castle, and many other buildings. There are seven churches, the largest of which is the cathedral, formerly belonging to the Jesuits. Other remarkable buildings are the government-house, the new county hall, where the provincial estates meet, a very magnificent edifice; the town-hall, built in 1414; the city brewery, the custom-house, the gymnasium, the handsome theatre, and the great imperial manufactory of woollen cloths and carpets, which in its most flourishing period gave employment, directly or indirectly, as it is stated, to 25,000 workmen, and used 5000 cwt. of wool annually. At present the number of workmen is only 10,500, exclusive of the numerous mechanics and artisans in Linz to whom it affords employment. It suffered severely by the French invasions. Linz is a bishop's see, and has a lyceum, with a library of 25,000 volumes, several public schools, a deaf and dumb asylum, and many charitable institutions. There are considerable manufactures of calico, dimity, leather, gunpowder, &c. The population of the town and suburbs, including some adjacent villages, is 23,500. It is a place of considerable trade, which the iron railroad to Budweis in Bohemia and the lately established steam-navigation of the Danube to the Black Sea must greatly increase. In order to defend Austria on the west, Linz was chosen for the execution of a new system of fortification invented by the Archduke Maximilian of Este.

LION, the English name for the form in which carnivorous development is generally considered to be the most perfect: Λέων (Leon) of the Greeks (Λέαινα, Lioness); *Leo* of the Romans (*Lea* and *Leæna*, Lioness); *Leone* of the Italians (*Leonessa*, Lioness); *Leon* of the Spanish; *Lion* of the French (*Lionne*, Lioness, *Linceau*, whelp); *Löwe* of the Germans (*Löwinn*, Lioness). The male is, as a general rule, ornamented with a mane; the female has no such ornament.

ORGANIZATION.



Skeleton of Lion.

The organization of the lion is treated of in the article FELIS, vol. x., and the reader is requested to bear in mind that the short descriptions under the figures of the claws (p. 218) are misplaced; *fig.* 1 being from the forefoot, and *fig.* 2 from the hind foot. In addition to the points there stated we must draw attention to the following. There are, it appears, distinguishing characteristics marking the differences between the skulls of the *Lion* and *Tiger*; and Mr. Owen explained these to a meeting of the Zoological Society of London (1834), when several crania of these two species were exhibited. He adverted to the distinctions pointed out by Cuvier in the 'Ossemens Fossiles,' and remarked on the first of them, viz. the straightness of the outline in the lion from the midspace of the postorbital processes to the end of the nasal bones in one direction, and to the occiput in the other, as not being in all cases available; but he regarded the second distinction—the flattening of the interorbital space in the lion and its convexity in the tiger—as being more constant and appreciable. He pointed out however a distinction which had never, according to his belief, been published, which is, he observed, well marked, and which appears to be constant; for he found it to prevail throughout the whole of the skulls of these animals which he had examined, including ten of the lion, and upwards of twenty of the tiger. It consists in the prolongation backwards in the cranium of the lion, of the nasal processes of the maxillary bones to the same transverse line which is attained by the coronal or superior ends of the nasal bones; in the tiger the nasal processes of the maxillary bones never extend nearer to the transverse plane attained by the nasal bones than one-third of an inch, and sometimes fall short of it by two-thirds, terminating also broadly in a straight or angular outline, just as though the rounded and somewhat pointed ends which these processes have in the lion had been cut off. Mr. Owen noticed also minor differences in the form of the nasal aperture, which in the tiger is disposed to narrow downwards and become somewhat triangular, while in the lion its tendency is towards a square shape; in the deeper sinking in a longitudinal depression of the coronal extremities of the nasal bones in the tiger than in the lion; in the bounding of this depression above in most of the tigers' crania by a small but distinct semilunar ridge, which is not found in those of the lion; and in the larger comparative size, chiefly in their transverse diameter of the infraorbital *foramina* in the lion. Mr. Owen remarked that it was curious that these foramina were double either on one or both sides in the only four skulls examined of lions which were known to be Asiatic, whilst in all the others the *foramen* was single on each side. (*Zool. Proc.*, 1834.)

Another communication to the same Society becomes interesting from its being associated with the popular belief that the lion lashes his sides with his tail to stimulate himself into rage. There was exhibited at one of the meetings (1832) a claw obtained from the tip of the tail of a young Barbary lion presented to the Society's menagerie by Sir Thomas Reade, then his majesty's consul at Tripoli. It was detected on the living animal by Mr. Bennett, and pointed out to the keeper, in whose hands it came off whilst he was examining it. The specimen having been submitted to Mr. Woods for description, that gentleman commenced by referring to the antient writers quoted by Blumenbach. Homer (*Il.*, xx.), Lucan (*Pharsal.*, i. 208), Pliny (*Hist.*, viii.), among others, who had described the lion (erroneously) as lashing himself with his tail when angry, or to provoke himself to rage. None of those writers however, he remarked, advert to any peculiarity in the Lion's tail to which so extraordinary a function might, however incorrectly, be attributed; but Didymus Alexandrinus, a commentator on the 'Iliad,' cited by Blumenbach, having found a black prickle like horn among the hair of the tail, immediately conjectured that he had ascertained the true cause of the stimulus when the animal flourishes his tail in defiance of his enemies, remarking that when punctured by this prickle the Lion becomes more irritable from the pain which it occasions. Mr. Woods then noticed the oblivion into which the subject fell for centuries till Blumenbach, who observes also that the later commentators, Heyne for instance, had noticed the opinion above stated, revived it (now about twenty-six years since), Blumenbach having verified the accuracy of Didymus Alexandrinus as to the fact, though he did not admit the commentator's induction. Blumenbach described the prickle as small, dark-coloured, hard as horn, placed in the very tip of the Lion's tail, surrounded at its base by an annular fold of the skin, and adhering firmly to a singular follicle of a glandular appearance. But Blumenbach remarked that these parts were so minute, and the small horny apex so buried in the tuft of hair, that the use attributed to it by the antient scholiast can only be regarded as imaginary. Again, according to Mr. Woods, the subject appears to have slumbered till 1829, when M. Deshayes announced (*Ann. des Sci. Nat.*, vol. vii.) that he had found the prickle both of a Lion and Lioness which died in the French menagerie, and described it as a little nail or horny production, about two lines in length, presenting the form of a small cone, a little recurved upon itself, and adhering by its base only to the skin and not to the last caudal *vertebra*, from which it was separated by a space of two or three lines. From that period Mr. Woods suffered no opportunity to escape him of examining the tails of every Lion, living or dead, to which he could gain access; but in no instance had he succeeded in finding the prickle till the specimen which was then before the committee was placed in his hands, within half an hour after its removal from the living animal, and while yet soft at its base where it had been attached to the skin. He described it as formed of corneous matter like an ordinary nail, and solid throughout the greater part of its length towards the *apex*, where it is sharp; and at the other extremity as hollow, and a little expanded. Its shape was rather singular, being nearly straight for one-third of its length, then slightly constricted (forming a very obtuse angle at the point of constriction), and afterwards swelling out like the bulb of a bristle to its termination. It was laterally flattened throughout its entire length, which did not amount to quite three-eighths of an inch. It was of a horn-colour, but became darker, nearly to blackness, at the tip. Its appearance, Mr. Woods observed, would lead to the belief that it was deeply inserted into the skin, with which however, from the readiness with which it became detached, its connexion must have been very slight. It is to this slightness of adhesion that M. Deshayes attributes its usual absence in stuffed specimens; and the same cause will account for its absence in by far the greater number of living individuals; for, as Mr. Woods remarked, its presence or absence does not depend upon age, because the Paris lions in which it was found were of considerable size, while that belonging to the Society was very small and young; nor upon sex, for although wanting in the female cub of the same litter at the Society's Gardens, it existed in the Lioness at the Jardin du Roi.

Mr. Woods, thinking it probable that these prickles might exist in other species of *Felis*, had previously examined the tails of nearly the whole of the stuffed skins in the Society's museum, but failed in detecting it in every instance but one. This was an adult Asiatic leopard, in which the nail was evident, although extremely small. It was short and straight, and perfectly conical, with a broad base. Mr. Woods observed that it was stated in a note in the 'Edinburgh Philosophical Journal,' where a translation of Blumenbach's paper had been given, that a claw or prickle had also been observed by the editor of that work on the tail of a leopard. No such structure however was detected by Mr. Woods on a living individual in the Society's menagerie. In the leopard therefore, as in the lion, it appears to be only occasionally present. In both it is seated at the extreme tip of the tail, and is altogether unconnected with the terminal caudal vertebra. From the narrowness and shape of its base, the circumference of which is by far too small to allow of its being fitted like a cap upon the end of the tail, it appeared to Mr. Woods rather to be inserted into the skin, like the bulb of a bristle or *vibrissa*, than to adhere to it by the margin, as described by M. Deshayes. Neither the published observations of that zoologist nor the discovery then communicated to the Society could, it was observed, throw any light on the existence or structure of the supposed glandular follicle noticed by Blumenbach.

Mr. Woods concluded by remarking that it is difficult to conjecture the use of these prickles, their application as a stimulus to anger being of course out of the question; but he observed that it could not be very important, for, to say nothing of their small size and envelopment in the fur, the majority of individuals, in consequence of the readiness with which the part is detached, are deprived of it for the remainder of their lives. (*Zool. Proc.*, 1832.)*

Prickle at the end of Lion's tail. (Blumenbach.)

Emasculation, it is stated, prevents the development of the mane; and the Lion so mutilated is said never to roar.

GEOGRAPHICAL DISTRIBUTION.

The true Lions belong to the Old World exclusively, and they were formerly widely and plentifully diffused; but at present they are confined to Asia and Africa, and they are becoming every day more and more scarce in those quarters of the globe. That Lions were once found in Europe there can be no doubt. Thus it is recorded by Herodotus that the baggage camels of the army of Xerxes were attacked by Lions in the country of the Pæonians and Crestonæi, on their march from Acanthus (near the peninsula of Mount Athos) to Therme, afterwards Thessalonica (now Saloniki): the camels alone, it is stated, were attacked, other beasts remaining untouched as well as men. The same historian also observes that the limits in Europe within which Lions were then found were the Nessus or Nestus, a Thracian river running through Abdera, and the Achelous, which waters Acarnania. (Herod., vii., c. 125-126, Schweighæuser; and see the article ATHOS, p. 23.) Aristotle (vi. 31) says that the Lion is in fact an animal but little known. 'In the whole of Europe, for example, there are no Lions, except between the Achelous and the Nessus.' Again, the same author (viii., xxviii., 33 of Scaliger's division) mentions Europe as abundant in Lions, and especially in that part which is between the Achelous and Nessus; apparently copying the statement of Herodotus. Pliny (viii. 16) does the same, and adds that the Lions of Europe are stronger than those of Africa and Syria. Pausanias copies the same story as to the attack of the Lions on the camels of Xerxes; and he states moreover that Lions often descended into the plains at the foot of Olympus, which separates Macedonia from Thessaly, and that Polydamas, a celebrated athlete, a contemporary of Darius Nothus, slew one of them, although he was unarmed. The passage in Oppian (*Cyneg.*, iii. 22) which some have considered as indicating the existence of Lions up to the banks of the Danube, fails as an authority for placing the Lion in that locality, because, as Cuvier observes, the context shows plainly that the name of Ister is there applied to an Armenian river, either by an error of the author or of the transcribers.

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* And see post, description of the Maneless Lion of Guzerat, p. 33.

Nor is Europe the only part of the world from which the form of the Lion has disappeared. Lions are no longer to be found in Egypt, Palestine, or Syria, where they once were evidently far from uncommon. The frequent allusions to the Lion in the Holy Scriptures and the various Hebrew terms there used to distinguish the different ages and sex of the animal (see particularly *Jer.*, li., 38; *Ezek.*, xix., 2; *Nah.*, ii., 13, גור, *Gor*, a little Lion or Lion's whelp: *Ezek.*, xix., 2, 3; *Psalm* xci., 13; *Prov.*, xix., 12, &c.; כפיר, *Chephir*, a weaned Lion, that is able to leave the mother and hunt prey for itself: *Nah.*, ii., 12, &c.; ארי, *Ari*, a full-grown strong Lion, the most general name: *Job.*, iv., 10; x., 16; *Psalm* xci. 13; *Prov.*, xxvi., 13; *Hosea*, v. 14; xiii. 7; שחל, *Shacal*, a Lion in his prime, a black Lion: *Job*, iv., 10; *Prov.*, xxx., 30; ליש, *Laish*, a ferocious or angry Lion; compare the Greek *lis*, λῖς: see also *Job*, iv. 10, 11, &c.), prove a familiarity with the habits of the race. Even in Asia generally, with the exception of some countries between India and Persia and some districts of Arabia, these magnificent beasts have, as Cuvier observes, become comparatively rare, and this is not to be wondered at. To say nothing of the immense draughts on the race for the Roman arena,—and they were not inconsiderable, for, as Zimmerman has shown, there were a thousand Lions killed at Rome in the space of forty years,*—population and civilization have gradually driven them within narrower limits, and their destruction has been rapidly worked in modern times when fire-arms have been used against them instead of the bow and the spear. The African Lion is annually retiring before the persecution of man farther and farther from the Cape. Mr. Bennett (*Tower Menagerie*) says of the Lion: 'His true country is Africa, in the vast and untrodden wilds of which, from the immense deserts of the north to the trackless forests of the south, he reigns supreme and uncontrolled. In the sandy deserts of Arabia, in some of the wild districts of Persia, and in the vast jungles of Hindostan, he still maintains a precarious footing; but from the classic soil of Greece, as well as from the whole of Asia Minor, both of which were once exposed to his ravages, he has been utterly dislodged and extirpated.'

LIONS OF THE OLD WORLD.

Zoologists generally distinguish the Lion by its uniform yellow colour, the tuft of hair at the end of the tail, and the mane covering the head and shoulders of the male. This last ornament, as we shall presently see, is very much reduced in one variety, with which we have lately been made well acquainted by Captain Smee; indeed so scanty is it that it hardly deserves the name of a mane at all.

If we go back to an early period, we shall find varieties of this great cat, usually considered as the strongest of the family, depending on the greater or less intensity of colour for the most part, mentioned by antient writers on natural history. Thus Aristotle (ix. 44) distinguishes two kinds of Lions, one rounder than the other (*στρογγυλώτερον*), and which has the mane more curled (*οὐλοτριχώτερον*), which he states to be the most timid (*δειλότερον*); the other longer and with a well-developed mane (*εὔτριχον*), which he says is more courageous (*ἀνδρειότερον*). Pliny (viii. 16) remarks that the Lion is most noble when a mane covers his neck and shoulders; and he also (loc. cit.) alludes to a maneless Lion, the offspring of a monstrous connexion. ('Leoni præcipua generositas, tunc cum colla armosque vestiunt jubæ. Id enim ætate contingit e leone conceptis. Quos vero pardi generavere, insigni hoc carent.') In Africa, he goes on to remark, such connexions are frequent: 'Multiformes ibi animalium partus, varie fœminis cujusque generis mares aut vi aut voluptate miscente;' whence, he adds, the Greek vulgar saying, that Africa is always producing something new. In the same chapter Pliny, after alluding to the European Lions and their comparative boldness, as above stated, repeats the observation of Aristotle, that there are two kinds of Lions, one compact and short with curled mane, which are more timid than those with a long and simple one ('longo simplicique villo'); which last despise the wounds inflicted on them. In the 17th chapter of the same book, Syria is stated to be the locality of a black Lion (see opposite column): 'cæteris unus cujusque generis color est. Leonum tantum in Syria niger.' Ælian (xvii. 26) distinguishes the Lions which come from India from other Lions, stating that the skin of the Indian Lions is black. Oppian (iii.), towards the beginning of that book, notices the differences between the Lions of Armenia, Arabia (*Ἐρεμβῶν ἄρουρα*), Libya, and Ethiopia.

These distinctions are altogether rejected by Buffon, who denies that there are different kinds of Lions. He denies, also, that any Lion has a curled mane, which, by the way, Aristotle does not assert, for he only says that one kind has the mane *more curly* than the other. Buffon further affirms, that the Lions of Africa and Asia entirely resemble each other; and declares that if the Lions of the mountains differ from those of the plains, the difference is less in the colour of the skin than in the size of the respective animals.

Linnæus, in his last edition of the 'Syst. Nat.,' notices no varieties: he places *Felis Leo* at the head of his genus *Felis*, with Africa only as the *habitat*. Neither does Gmelin distinguish any varieties, but he much increases the distribution; for he speaks of the Lion as inhabiting Africa, especially in the interior, as being rarer in the deserts of Persia, India, and Japan, and as having formerly occurred in other warmer parts of Asia, in Palestine, in Armenia, and in Thrace.

Pennant ('Hist. Quadr.,' 3rd edition) appears to coincide in opinion with Buffon, Linnæus, and Gmelin; for he mentions no distinctions, and describes the Lion as 'an inhabitant of most parts of Africa, and rarely of the hot parts of Asia, such as India and Persia; and a few are still met with in the deserts between Bagdat and Bassorah, on the banks of the Euphrates. Mr. Niebuhr also places them among the animals of Arabia; but their proper country is Africa, where their size is the largest, their numbers greatest, and their rage more tremendous, being inflamed by the influence of a burning sun upon a most arid soil. Doctor Fryer says that those of India are feeble and cowardly. In the interior parts, amidst the scorched and desolate deserts of Zaara, or Biledulgerid, they reign sole masters; they lord it over every beast, and their courage never meets with a check, where the climate keeps mankind at a distance; the nearer they approach the inhabitants of the human race, the less their rage, or rather the greater is their timidity; they have often experienced the unequal combat, and finding that there exists a being superior to them, commit their ravages with more caution; a cooler climate again has the same effect; but in the burning deserts, where rivers and fountains are denied, they live in a perpetual fever, a sort of madness fatal to every animal they meet with.'

Dr. Leach raised the form to the rank of a genus under the name of *Leo*.

M. Lesson, in his 'Manuel' (1827), gives four varieties, viz. the Lion of Barbary, the Lion of Senegal, the Lion of Persia or Arabia, and the Lion of the Cape.

Cuvier ('Règne Animal,' his last edit., 1829) places at the head of the great genus Felis '*Le Lion* (*Felis Leo*, Linn.)' and describes it as distinguished by its uniform yellow colour, the tuft of hair at the end of the tail and the mane which covers the head, neck, and shoulders of the male. 'It is,' continues Cuvier, 'the strongest and the most courageous of the animals of prey. Spread, at one time, over all the parts of the antient world, it would appear at the present day nearly confined to Africa and some neighbouring parts of Asia.'

M. Temminck, in his 'Monograph,' includes three varieties under *Felis Leo*, namely the Lions of Barbary, Senegal, and Persia, and these are retained in Dr. Fischer's Synopsis.

Mr. Bennett ('Tower Menagerie,' 1829) notices the Bengal Lion, the Cape Lion, and the Barbary variety (figuring the two former), and observes upon their distinctions.

Sir William Jardine (*Naturalists' Library*, 'Mammalia,' vol. ii., *Felinæ*, 1834), in addition to other plates, has given a figure of the Asiatic variety from a specimen in the Surrey Zoological Gardens, and after noticing that the Lions of Africa and India have been described as varieties, states his strong suspicions that future observations will prove these animals to be in reality distinct species, and notices them separately under the names of *Leo Africanus* and *Leo Asiaticus;* he also alludes to the *Maneless Lion*, a notice of which had just appeared in the proceedings of the Zoological Society of London, with a promise of further details in the Transactions of that Society, in a paper which has since been published, and to which we shall presently call the reader's attention.

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* Sylla gave a combat of one hundred lions at once in his ædileship; but this bloody exhibition is insignificant when compared with those of Pompey and Cæsar, the former of whom exhibited a fight of six hundred, and the latter of four hundred. In Pompey's show, three hundred and fifteen of the six hundred were males. The early emperors consumed great numbers, frequently a hundred at a time, to gratify the people.

Mr. Swainson (*Classification of Quadrupeds*, 1835) places 'the African Lion (*Leo Africanus*, Sw.) at the head of the *Felidæ*. In his arrangement at the end of the volume he notices the form under the designation of 'Leo Antiquorum, *Lions*. Head and neck furnished with a mane of long hair; tail tufted.' The next genus, 'Felis, L., Cats,' he characterizes thus: 'No mane; tail long, not tufted.' In his 'Animals in Menageries,' 1838, the Lion does not appear to be noticed.

African Lions.—Temminck notices two varieties of the *African Lion*—that of *Barbary* and that of *Senegal*. M. Lesson adopts these two varieties, and adds the *Lion of the Cape*, of which he gives two varieties.

The Lion of Barbary.—This Lion is described as having a deep yellowish-brown fur, and the mane of the male is stated to be very much developed.

The Lion of Senegal is characterized by a fur of a more yellow tint, the mane in the male being less thick, and nearly wanting upon the breast and insides of the legs.

The Lion of the Cape presents two varieties, one yellowish and the other brown, the latter is regarded as the most ferocious and formidable. The Dutch colonists speak of the 'Blue and the Black' kinds, and it seems indeed that there is a 'black-maned' Lion, one of which, accompanied by his Lioness, Mr. Burchell appears to have encountered in his travels in Africa. (See post.)

Habits, Chace, &c.—Mr. Burchell well observes, that 'King of the Forest' is a title not very applicable to an animal which he, at least, never met but on the plains; nor did he ever meet with one in any of the forests where he had been. The low cover that creeps along the sides of streams, the patches that mark the springs or the rank grass of the valley, seem to be the shelter which the African Lion for the most part seeks. Of the strength of this variety we have most extraordinary examples on record. To carry off a man,—and there are dismal accounts of this horrible fact, which there is no reason to doubt,—appears to be a feat of no difficulty to this powerful brute. Indeed when we find that a Cape Lion seized a heifer in his mouth, and, though the legs dragged upon the ground, seemed to carry her off with the same ease as a cat does a rat, leaping over a broad dike with her without the least difficulty,—that another, and a young one too, conveyed a horse about a mile from the spot where he had killed it—and that a third, which had carried off a two-year old heifer, was followed on the spoor, or track, for five hours by horsemen, when it appeared that throughout the whole distance the carcass of the heifer was only once or twice discovered to have touched the ground,[*]—the asportation of a man shrinks into insignificance as a demonstration of strengh. There seems to be an idea that the Lion prefers a human prey; but be this as it may, the inhabitants of certain districts have, it appears, been under the necessity of resorting to a curious expedient to get out of their reach. Messrs. Schoon and M'Luckie, in 1829, penetrated to the eastward of Kurrichaine, situated about 200 miles to the north-east of Litakou. They discovered, east of Kurrichaine, or Chuan, as it is more properly named, the river Moriqua, which rises in the south between the 25th and 26th degrees of latitude, and 29th and 30th degrees of longitude, taking a north-easterly course, and about 100 miles from the ford enters a high ridge of mountains. From hence, according to the natives, it flows into the sea, through the country of the Mantatees. About 70 miles to the eastward, the range of mountains takes a direction north and south. At the distance of 14 miles to the south, along the base of the mountains, is a place called 'Ongorutcie-Fountain,' where there is a large tree containing seventeen conical huts. These are used as dormitories, being beyond the reach of the Lions, which, since the incursion of the Mantatees, when so many thousands of persons were massacred, have become very numerous in the neighbourhood and destructive to human life.[†] The branches of these trees are supported by forked sticks or poles, and there are three tiers or platforms on which the huts are constructed. The lowest is nine feet from the ground, and holds ten huts; the second, about eight feet high, has three huts; and the upper story, if it may be so called, contains four. The ascent to these is made by notches cut in the supporting poles, and the huts are built with twigs thatched with straw, and will contain two persons conveniently. The travellers had previously visited several deserted villages similarly built between the Moriqua and Leutlecan rivers, as well as in other places. But these were erected on stakes about eight feet above the ground and about forty feet square, larger in some places, and containing about seventy or eighty huts. The inhabitants sit, it is stated, under the shade of these platforms during the day, and retire to the elevated huts at night.[*]

The general prey of the African Lion consists of the larger herbivorous quadrupeds, very few of which it is unable to master, and it is a severe scourge to the farmer, who is consequently ever on the look-out for lions, and generally a most imperturbable and unerring shot. Though mortal accidents frequently happen in these huntings, the cool sportsman seldom fails of using his rifle with effect. Lions when roused, it seems, walk off quietly at first, and if no cover is near, and they are not pursued, they gradually mend their pace to a trot, till they have reached a good distance, and then they bound away. Their demeanour upon these occasions has been described to us by eye-witnesses to be of a careless description, as if they did not want a fray, but if pressed, were ready to fight it out. If they are pursued closely, they turn and couch, generally with their faces to the adversary; then the nerves of the sportsman are tried. If he is collected and master of his craft, the well directed rifle ends the scene at once; but if, in the flutter of the moment, the vital parts are missed, or the ball passes by, leaving the lion unhurt, the infuriated beast frequently charges on his enemies, dealing destruction around him. This however is not always the case, and a steady unshrinking deportment has, in more instances than one, saved the life of the hunter. Mr. Burchell gives an interesting account in his African travels of his confronting one of these animals. 'The day was exceedingly pleasant, and there was not a cloud to be seen. For a mile or two, we travelled along the banks of the river, which, in this part, abounded in tall mat-rushes. The dogs seemed much to enjoy prowling about, and examining every bushy place, and at last met with some object among the rushes which caused them to set up a most vehement and determined barking. We explored the spot with caution, as we suspected, from the peculiar tone of their bark, that it was what we suspected it to be,—lions. Having encouraged the dogs to drive them out, a task which they performed with great willingness, we had a full view of an enormous black-maned lion and lioness. The latter was seen only for a minute, as she made her escape up the river, under the concealment of the rushes; but the lion came steadily forward and stood still to look at us. At this moment we felt our situation not free from danger, as the animal seemed preparing to spring upon us, and we were standing on the bank, at the distance of only a few yards from him, most of us being on foot and unarmed, without any visible possibility of escaping. I had given up my horse to the hunters, and was on foot myself; but there was no time for fear, and it was useless to attempt avoiding him. . . . I stood well upon my guard, holding my pistols in my hand, with my finger upon the trigger; and those who had muskets kept themselves prepared in the same manner. But at this instant the dogs boldly flew in between us and the lion, and surrounding him, kept him at bay by their violent and resolute barking. The courage of those faithful animals was most admirable: they advanced up to the side of the huge beast, and stood making the greatest clamour in his face, without the least appearance of fear. The lion, conscious of his strength, remained unmoved at their noisy attempts, and kept his head turned towards us. At one moment, the dogs perceiving his eye thus engaged, had advanced close to his feet, and seemed as if they would actually seize hold of him; but they paid dearly for their imprudence, for, without discomposing the majestic and steady attitude in which he stood fixed, he merely moved his paw, and, at the next instant, I beheld two lying dead. In doing this he made so little exertion, that it was scarcely perceptible by what means they had been killed. Of the time which we gained by the interference of the dogs, not a moment was lost: we fired upon him; one of the balls went through his side, just between the short ribs, and the blood began to flow, but the animal still remained standing in the same position. We had now no doubt that he would spring upon us: every gun was instantly reloaded; but happily we were mistaken, and were not sorry to see him move quietly away, though I had hoped in a few minutes to have been enabled to take hold of his paw without danger.' Even where the hunter has been seized with a panic and pursued, a timely recovery of self-possession has saved him. Sparrman relates that Jacob Kok of Zee-koe-rivier, one day walking over his lands with his loaded gun, unexpectedly met a lion. Being an excellent shot, he thought himself pretty certain, from the position in which he was, of killing it, and therefore fired his piece. Unfortunately he did not recollect that the charge had been in it for some time, and consequently was damp; so that his piece hung fire, and the ball falling short, entered the ground close to the lion. In consequence of this he was seized with a panic and took directly to his heels; but being soon out of breath and closely pursued by the lion, he jumped up on a little heap of stones, and there made a stand, presenting the butt end of his gun to his adversary, fully resolved to defend his life as well as he could to the utmost. This deportment had such an effect on his pursuer, that he also made a stand, and lay down at the distance of a few paces from the heap of stones, seemingly quite unconcerned. Jacob, in the mean time, did not stir from the spot; besides he had in his flight unfortunately dropped his powder-horn. At length, after waiting a good half-hour, the lion rose up, and at first went very slowly, and step by step only, as if he had a mind to steal off; but as soon as he got to a greater distance, he began to bound away at a great rate. There is hardly a book of African travels which does not teem with the dangers and hair-breadth escapes of the lion-hunters, and hardly one that does not include a fatal issue to some engaged in this hazardous sport; but our limits will not allow us to enter into further details on this part of the subject, and we must refer to such works for accounts—and they are very interesting—of the different modes of destruction employed against this powerful beast, from the poisoned arrow of the Bushman to the rifle of the colonist.

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[*] Sparrman; Thompson.

[†] Ælian (xvii. 27) records the extinction of a Libyan people by an invasion of Lions.

[*] See 'South African Journal,' September, 1830; and Steedman's 'Wanderings and Adventures in the interior of Southern Africa,' where the reader will find a drawing of the inhabited tree above described, taken by Mr. Moffat of Litakou, who also visited this spot.

African Lion. (Barbary.)

ASIATIC LIONS.—Of these, three kinds are mentioned:—The *Bengal Lion*, the *Persian* or *Arabian Lion*, and the *Maneless Lion* of Guzerat.

The Bengal Lion.—Mr. Bennett points out the characteristics by which the Asiatic race is distinguished from that of Southern Africa, as consisting principally in the larger size, the more regular and graceful form, the generally darker colour, and the less extensive mane of the African. He gives a beautiful cut of the Bengal Lion, executed by Harvey, in the 'Tower Menagerie,' from a very fine specimen little more than five years old, then in that collection, but called by the keepers 'The Old Lion.' The magnificent development of the mane is very striking in this figure.

Lion (mane not quite fully developed) from Eastern Asia, with Lioness

The Persian or Arabian Lion.—This is stated to be distinguishable by the pale Isabella colour of the fur, and those which have been exhibited in England as Persian Lions certainly bear out this remark; but Captain Smee, to whose interesting paper we shall presently have to call attention, observes that the *Persian Lion* exhibited at the Surrey Zoological Gardens seemed to him to differ but little from individuals known to be brought from Africa. (See the next section.)

Persian Lion.

The Maneless Lion of Guzerat.—The reader will bear in mind the passage above quoted from Pliny (viii. 16), touching Lions which have no mane, and of the origin attributed to them. Cuvier notices the statement, that maneless lions had been found on the confines of Arabia, and merely refers to Olivier, observing that there is no detailed description given of them. A zoological description is doubtless not to be found in Olivier; but he enters somewhat minutely into the subject, as the reader will here see. 'The Lion,' says Olivier (*Voyage dans l'Empire Othoman, l'Egypte, et la Perse*, tom. iv.), 'which inhabits the part of Arabia and Persia near the river of the Arabs, from the Persian Gulf to the environs of Helle and of Bagdad, is probably the species of Lion of which Aristotle and Pliny have spoken, and which they regarded as a different species from that which is spread over the interior of Africa. The Lion of Arabia has neither the courage, nor the stature, nor even the beauty of the other. When he would seize his prey he has recourse to cunning rather than force: he crouches among the reeds which border the Tigris and Euphrates, and springs upon all the feeble animals which come there to quench their thirst, but he dares not to attack the boar which is very common there, and flies as soon as he perceives a man, a woman, or even a child. If he catches a sheep, he makes off with his prey; but he abandons it to save himself, when an Arab runs after him. If he is hunted by horsemen, which often happens, he does not defend himself, unless he is wounded and has no hope of safety by flight. In such a case he will fly on a man and tear him to pieces with his claws; for it is courage more than strength that he wants. Achmed, pacha of Bagdad from 1724 to 1747, would have been torn by one, after breaking his lance, in a hunt, if his slave Suleiman, who succeeded him in the pachalik, had not come promptly to his succour, and pierced with a blow of his yataghan the lion already wounded by his master.'

'We saw,' continues Olivier, 'five individuals of this race in the menagerie of the pacha of Bagdad; they had been there five years and had been taken young in the environs of Bassora: there were three males and two females; the former were a little larger than the latter; and all much resembled the African species, excepting that they were smaller and had no mane. We were assured that they never had any, and that no lion of these countries had one. We have often regretted that we did not ask the pacha for two of them, in order to a close comparison with the African species, and to satisfy ourselves whether the lion of Arabia ought to be regarded as a species distinct from the other, or as a degenerated race.'

In Griffith's Cuvier's 'Règne Animal' there is a notice that a maneless and brownish coloured species of *Felis*, larger than a *Lion*, had been expected to be forwarded from Nubia to the Frankfort Museum.

In December 1833, Captain Walter Smee exhibited to a meeting of the Zoological Society of London the skins of a Lion and Lioness killed by him in Guzerat, and selected from eleven obtained there by him, eight of which he had brought to this country. This Lion, he stated, is distinguished from those previously known by the absence of a mane (that is, it is maneless as compared with other Lions), from the sides of the neck and shoulders, the middle line of the back of the neck being alone furnished with longer hairs, which are erect, like those in the same situation in the *Cheetah* (*Felis jubata*). The under surface of the neck has long loose silky hairs, and there is a tuft at the angle of the anterior legs. Besides the absence of the extensive mane, the tail is shorter than that of ordinary Lions, and is furnished at its tip with a much larger brush or tuft. In this tuft there existed in the oldest of Captain Smee's Lions, subsequently to the arrival of the skin in England, a short horny claw or nail, similar in form to, but somewhat larger in size than, that described by Mr. Woods, and above alluded to.

Captain Smee, who, in the Transactions of the Zoological Society, enters into a very minute description of the arrangement of the hair in this variety, both in the male and the female, observes that both the *African* and *Guzerat Lion* are subject to considerable variations in intensity of colouring. In both the colour is fulvous; but in some individuals, he says, this is much paler than in others, and in the darker specimens there occurs a tinge of red. The middle of the back is the most deeply coloured part, and the under surface is much paler and almost white. Among the hairs there is an intermixture of some which are entirely black, and the greater or less proportion which these bear to the paler ones is the principal cause of the variations in depth of colour that occur in different individuals. Of the *Guzerat Lions* the oldest individual is the lightest in colour. The tail becomes gradually paler towards its extremity, passing into greyish white; its terminal brush consisting of black hairs slightly tinged with brown. Above each eye is a pale space, in which is included a darker coloured spot for the implantation of the supraciliary *vibrissæ*, from twelve to fifteen in number, and of which the longest reaches nearly to the ears. In the *African Lion* these *vibrissæ* are implanted in a darker spot, but this spot is less defined, and is only partially bounded by a paler space. In both the points of insertion of the moustaches are darker than the surrounding parts. Captain Smee does not speak with certainty of the comparative form of these two varieties: but he states his impression to be that the *Lion of Guzerat* is comparatively more rounded and bulky in its body, and rather shorter in its limbs; and that its head especially is shorter, has less of the square form which distinguishes the open face of the male African Lion, and is more rounded on the forehead. But, as he observes, this difference may be chiefly owing to the long hairs which conceal the forehead in the one, while that feature is defined and visible in the other. The *cranium* of the Lion of Guzerat generally resembles that of the African race. Mr. Owen had remarked that the infra-orbital foramina were double in the only lions known to be Asiatic examined by him: in one, killed in North Guzerat, this occurs on both sides; in the other, killed near Assund, it is found on one side only. Captain Smee states that in a young skull of the *Maneless Lion* there exists on one side a double infra-orbital *foramen*, and that the existence of the same structure in another skull contained in one of the skins had been ascertained. A male maneless Lion killed by Captain Smee measured, including the tail, 8 feet 9¼ inches in length, and his total weight, exclusive of the entrails, was 35 stone (14 lbs. to the stone): the impression of his paw on the sand measured 6¼ inches across, and his height was 3 feet 6 inches. A female killed at the same time was 8 feet 7 inches long and 3 feet 4 inches high.

Locality and Habits of the Guzerat Lion.—These maneless Lions are, according to the author last above quoted, found in Guzerat along the banks of the Sombermuttee near Ahmedabad. During the hot months they inhabit the low bushy wooded plains that skirt the Bhardar and Sombermuttee rivers from Ahmedabad to the borders of Cutch, being driven out of the large adjoining tracts of high grass jungle (called Bheers) by the practice annually resorted to by the natives of setting fire to the grass, in order to clear it and ensure a succession of young shoots for the food of the cattle upon the first fall of the rains. They extend through a range of country about 40 miles in length, including various villages, and among others those of Booroo and Goliana, near which Captain Smee killed his finest specimens. They were so common in this district that he killed no fewer than eleven during a residence of about a month; yet scarcely any of the natives, except the cattle-keepers, had seen them previously to his coming among them. The cattle were frequently carried off or destroyed, but this they attributed to *Tigers*: Captain Smee however observes, that the Tiger does not exist in that part of the country. Those natives to whom the Lions were known gave them the name of *Ontiah Baug*, or *Camel Tiger*, an appellation derived from their resemblance in colour to the Camel. They appear to be very destructive to the domesticated cattle, and the remains of a considerable number of carcasses of bullocks were found near the place where Captain Smee's specimens were killed; about ten days previously, four donkeys had been destroyed at the village of Cashwah. Captain Smee could not learn that men had been attacked by them. When struck by a ball, they exhibited great boldness, standing as if preparing to resist their pursuers, and then going off slowly and in a very sullen manner; unlike the Tiger, which on such occasions retreats springing and snarling. Captain Smee states that these Lions are also found on the Rhun near Rhunpor, and near Puttun in Guzerat, and that some persons who saw them in Bombay said that they also occur in Sind and in Persia; he further observes, that should subsequent inquiries prove that Olivier was correctly informed as to the locality from which the *Maneless Lions* seen by him at Bagdad were obtained, and prove also their identity with those of Guzerat, a more extensive geographical range will be established for this curious race than Captain Smee is at present disposed to regard as probable.

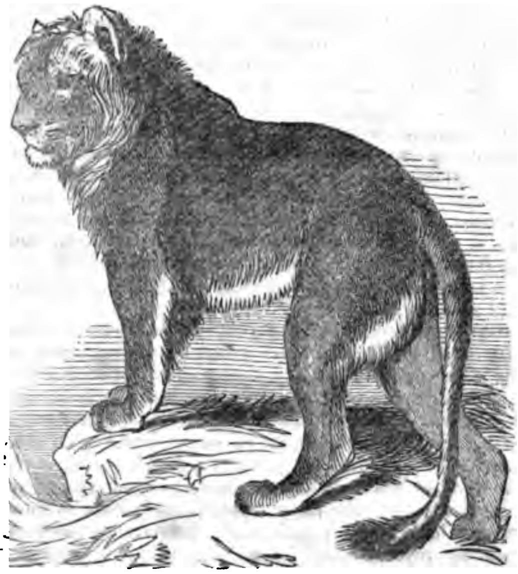
Captain Smee remarks that he is aware that the existence of these maneless Lions in Guzerat had been previously although by no means generally known, and quotes Lieut. Col. Sykes as having this knowledge. Sir Charles Malet had also seen Lions on the banks of the Sombermuttee, and though he makes no mention of the absence of the mane, Captain Smee thinks that they in all probability belonged to this maneless race, and indeed Sir Charles attributes to his Lion the native name noticed by Captain Smee above.

Our author makes the following remarks on the passages to be found in the antient writers bearing on this subject: 'Having alluded in the commencement of this communication, to the opinion that a *maneless Lion* was known to the antients, it might be expected that I should here bring forward and discuss the several passages which have been looked upon as supporting this view. Where however the critics are at fault, it would be presumptuous in me to attempt to decide. I own that I do not find in the passages usually referred to any evidence at all satisfactory as regards the existence of Lions destitute of mane; and I am even far from willing to admit that the crisped hairs noticed by Aristotle as distinguishing one race of Lions from another, in which the hairs were either dense or straight, must of necessity be considered as those of the mane rather than of any other part of the body. The language of Oppian is equally obscure, and even the expressions used by him are warmly contested by the critics. Another Greek writer, Agatharchides, the peripatetic, speaks of the Arabian, and especially the Babylonish Lions, in terms that recall Olivier's description of those of Bagdad, but still with no definite application to the want of a mane. Pliny alone, so far as I am aware, mentions the absence of mane as a distinctive mark of one race of Lions; but to this race he attributes a monstrous generation, and he was probably altogether misled with respect to it.'

We may here remark that a maneless Lion is said to be represented on the monuments of Upper Egypt.

Captain Smee thus characterizes his Maneless Lion:—

Felis Leo, Linn., var. *Goojratensis*.—Mane of the male short, erect; tuft at the apex of the tail very large, black. (See *Zool. Proc.*, 1833; and also *Zool. Trans.*, vol. i., where an excellent figure is given.)



Maneless Lion of Guzerat.

Habits of the Asiatic varieties generally, Chace, &c.—The habits of the Asiatic Lions do not differ much from those of Africa, excepting that the former, from the state of the country, frequent the jungles. In India the elephant is generally employed in the chace, which is even now conducted with more pomp and circumstance than in Africa. The grand Asiatic huntings of former times, those of Genghis Khan for instance, will occur to many of our readers. The accounts of most Asiatic modern sportsmen give a most courageous bearing to the Lions in these encounters. One of these states that the Lions in India, instead of running away when pursued through a jungle, seldom take to cover as a refuge at all. On the approach of their enemies, they spring out to meet them openmouthed in the plain. They are thus easily shot; but if they are missed or only slightly wounded, they are most formidable adversaries. They are even said to have sprung on the heads of the largest elephants, and to have fairly pulled them to the ground, riders and all.

Reproduction of the Lion, &c.—The Lioness is said to go with young five months, and produces generally from two to three or four,[*] at a litter, which are born blind. Three, two males and a female, were whelped in the Tower on the 20th October, 1827, the day of the battle of Navarino; but the number seems generally to be two. In captivity the Lioness usually becomes very savage as soon as she becomes a mother; and in a state of nature both parents guard their young with the greatest jealousy. Mr. Bennett relates that in the commencement of the year 1823, General Watson, then on service in Bengal, being out one morning on horseback armed with a double-barrelled rifle, was suddenly surprised by a large male Lion, which bounded out upon him from the thick jungle at the distance of only a few yards. He instantly fired, and the shot taking complete effect, the animal fell dead almost at his feet. No sooner had the Lion fallen than the Lioness rushed out, which the General also shot at, and wounded severely, so that she retired into the thicket. Thinking that the den could not be far distant, he traced her to her retreat, and there dispatched her, and in the den were found two beautiful cubs, a male and a female, apparently not more than three days old. These the General brought away; they were suckled by a goat, and sent to England, where they arrived in September, 1823, as a present to George IV., and were lodged in the Tower. The male was the animal from which Mr. Bennett gives his figure and description of the Bengal Lion, and the female was the mother of the cubs whelped in the Tower, above alluded to. (*Tower Menagerie.*) The young are at first obscurely striped, or brindled, and somewhat tiger-like in the coat. There is generally a blackish stripe extending along the back, from which numerous other bands of the same colour branch off, nearly parallel to each other on the sides and tail. The head and limbs are generally obscurely spotted. When young they mew like a cat; as they advance, the uniform colour is gradually assumed, and at the age of ten or twelve months the mane begins to appear in the males; at the age of 18 months this appendage is considerably developed, and they begin to roar. (Bennett.) M. F. Cuvier states that it is nearly the third year before the mane and the tuft on the tail appear, and that they are not fully developed before the seventh or eighth year. It should however be borne in mind that the Bengal Lion mentioned by Mr. Bennett, and figured by him, was magnificently maned, and he was little more than five years old. The period of shedding the milk-teeth is very often fatal to the young animals in a state of captivity. The natural period of a Lion's life is generally supposed to be 20 or 22 years. Such is Buffon's limitation, but the animal will, it seems, live much longer. Pompey, the great Lion which died in 1760, was said to have been in the Tower above seventy years; and one from the river Gambia is stated to have since died there at the age of sixty-three.

The Lion, from its power and supposed generosity of disposition, has been popularly hailed as the king of beasts, and considered as the emblem of majesty and might. It is the symbol of the British nation, and is borne in the royal arms,[†] of which it forms one of the supporters, and which it surmounts as the crest.

The generosity of disposition so liberally accorded to this powerful beast has been much and eloquently praised. It seems almost sacrilegious to dissipate the glowing vision which Buffon has raised; but if there is any dependence to be placed on the observations of those travellers who have had the best opportunities of judging, and have the highest character for veracity, we must be compelled to acknowledge that Buffon's lion is the lion of poetry and prejudice, and very unlike the cautious lurking savage that steals on its comparatively weak prey by surprise, overwhelms it at once by the terror, the weight, and the violence of the attack, and is intent only on the gratification of its appetites. 'At the time,' says Mr. Burchell, 'when men first adopted the lion as the emblem of courage, it would seem that they regarded great size and strength as indicating it: but they were greatly mistaken in the character they had given of this indolent animal.' The fact of the Lion sparing the dog that was thrown to him, and making a friend of the little animal that was destined for his prey, has been much dwelt on; but these and other such acts of mercy, as they have been called, may be very easily accounted for. If not pressed by hunger, the Lion will seldom be at the trouble of killing prey; and the desire for a companion has created much stronger friendships between animals in confinement than that between a lion and a little dog.

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[*] Cuvier quotes Philostratus for the fact that Apollonius of Tyana saw near Babylon a Lioness that was killed and carried eight young ones; there were, it appears, in the time of Apollonius a great many Lions between the Hyphasis and the Ganges. This testimony, however, is of little or no value.

[†] Captain Smee remarks, in allusion to the hybrid mentioned by Pliny, that it is by no means improbable that the maneless feline beast which occurs in the older armorial bearings may have been intended to represent a Lion leoparded. This term, he observes, is still in use among the heralds of France, but is employed by them with reference only to the position of the head; if the full face is shown, the animal, whether maned or maneless, is in their language a leopard; if the side face alone is seen, it is a lion. Hence with them the lions passant and gardant of the arms of the kings of England would be either lions leoparded or leopards maned. The Captain goes on to state that the omission of the mane, in rude tricking, would indeed reduce them to leopards, and as such they were originally regarded. The emperor Frederic II., in choosing his present of three leopards to our Henry III., was actuated, according to Matthew Paris, by the bearing in the royal shield of England, 'in quo tres leopardi transeuntes figurantur.' ('Zool. Trans.')

The Lion is easily tamed, and capable of attachment to man. The story of Androdus, frequently called Androcles, is too well known to need more than allusion, and we learn from Bell's 'Travels' that the monarch of Persia had on days of audience two great Lions chained on each side of the passage to the state-room, led there by keepers in golden chains. Every wild-beast show almost has its tame Lion, with which the keeper takes the greatest liberties; liberties which the beast will suffer, generally speaking, from none but him. All these exhibitions have however been entirely eclipsed by the feats of Mr. Van Amburgh, who exercises a complete control over the Lions and other great *Felidæ* which he has subjected to his will.

HYBRIDS.

The Lion and Tigress will, under certain circumstances, produce young. This has happened twice in England. Sir William Jardine gives the figure of one of a litter so bred, and exhibited in Atkins's collection, where they were whelped, in 1827: they died young. Sir William Jardine correctly describes the colour of the whelps as brighter than that of the Lion, and the bands as better marked than they generally are in the true-bred young lion. The specimen figured by Sir William is in the Edinburgh museum. Another litter from similar parents was whelped at Windsor; but these also died before they came to maturity. There does not seem to be much difficulty in promoting this union.

Lion-Tiger Cubs.

PUMA, OR AMERICAN LION.

The uniformity of colour in this great cat, combined with considerable ferocity, were probably the reasons which induced early travellers in America, who heard of it perhaps with circumstances of exaggeration, or caught hasty glimpses of it not unaccompanied with terror, to state that there were Lions in America. Thus, John de Laet (1633) says, that Lions are found in Peru, though they be few, and not so ferocious as they are in Africa, and that they are called in the native tongue *Puma*. In an old tract (1649), entitled 'A Perfect Description of Virginia,' we find among the 'Beasts great and small,' 'Lyons, Beares, Leopards, Elkes,' &c; and Garcilasso tells us of the Puma, or Lion of Peru. In Hernandez (Romæ, 1651) there is a long account of the animal under the name of '*Puma*, seu *Leo Americanus*;' and reasons are given to show that it is not a true lion.* In Piso the animal is noticed as the *Cuguacuara*, and by Marcgrave as the *Cuguacurana* of the Brazilians; hence the French name *Couguar*. Charlevoix describes it clearly enough under the name of *Carcajou*, or *Quincajou*; this name Pennant thinks that Charlevoix gives by mistake. In D'Azara's *Gouazouara* of Paraguay we again trace the French name of this animal. Lawson and Catesby both describe it under the name of the *Panther*, by which designation it is known to the Anglo-Americans up to this day. It is the *Felis concolor* of Schreber and of zoologists generally, and though Linnæus is often quoted as the author of the name, it will not be found in his last edition of the *Systema Naturæ*. In Gmelin's edition it appears as *Felis concolor* (an error for *concolor*), with Schreber's description. It is the *Felis Puma* of Traill.

The reader will find in the 'Proceedings of the Zoological Society of London' (1833) a detailed account of the dissection of a Puma that had died at the Society's garden. The whole paper will well repay perusal, but our limits will only permit us to notice that point in which, it is allowed, one of the greatest differences obtains among the cats. This point is that part of the structure which is connected with the organs of voice, and, as Mr. Martin observes, some according modification must necessarily produce the deep-toned roar of the *Lion*, the snarl of the *Jaguar*, and the hissing cry of the *Puma*. 'The distance between the tongue and the *larynx* in the *Lion*,' says Mr. Martin, 'has been brought more than once under the notice of the Society; in the *Jaguar* this distance, comparatively speaking, is nearly as great; but in the *Puma*, an animal equal, or nearly so, in size to the *Jaguar*, the distance is reduced to an inconsiderable space, an inch, or an inch and a half, according as the tongue is more or less protruded. In addition to this it is worthy of observation that the circumference of the *larynx* in the *Puma* is also very inconsiderable; compare, for example, the *larynx* of the *Jaguar* with that of the present animal, both natives of the wilds of the American continent. In the *Jaguar* we find a larynx indicating, from its general magnitude, considerable depth in the intonations of the voice; whereas in the *Puma*, if we take either its diameter, or its distance from the termination of the palate and base of the tongue, we are led to expect neither the roar of the *Lion* nor the growl of the *Jaguar*, but the shrill tones of an animal, ferocious indeed, but of all others of the genus perhaps the most stealthy and insidious.' Mr. Martin stated that he thought that he had observed a kind of mutual correspondence between the voice and the habits of animals, and expressed his intention of offering a few observations on that point on a future occasion.

Description.—Adult Male. No mane. Silvery fawn *above*, sometimes reddish, the tawny hairs of the upper parts whitish at the tips; nearly white *beneath*, and on the inside of the limbs, whitish on the throat, chin, and upper lip. Head black and gray irregularly mixed; ears on the outside, and particularly at their base, sides of the muzzle whence the whiskers spring, and end of the tail (which has no tuft) black. Length from nose to tail about four feet; tail rather more than two.

Female coloured like the male. Head small when compared with his.

Young.—Back marked with three chains of spots, which are generally of a blackish brown; dispersed spots or markings on the neck, shoulders, and sides. N.B. As the animal advances in age these markings become more and more obscure, till they are at last lost in the uniform colour.

A specimen of a young *Puma* exhibited at a meeting of the Zoological Society in 1831 was, like the young of the other species of *Felis*, variously spotted and striped, the depth of its markings approaching nearly to black, and being more intense than that observed in the Lion. The muzzle was nearly black, as was also the greater part of the tail. This young one had been recently brought forth at the Society's garden, but died immediately; it was strongly contrasted with a specimen of the adult placed on the table for comparison.

Geographical Distribution.—North and South America. There is reason to think that it was formerly to be found from Canada to Patagonia, with an extensive range to the east and west, but its geographical area has been very much diminished, and is daily becoming more and more contracted before that civilization which is in our own time obliterating more species than one. Mr. Washington Irving ('Astoria') mentions it as being about the mouth of the Columbia River.

Habits, Chace, &c.—Lawson (*Carolina*) gives the following characteristic account of the Puma. 'The *Panther* is of the cat's kind; about the height of a very large greyhound, of a reddish colour, the same as a Lion. He climbs trees with the greatest agility imaginable, is very strong limbed, catching a piece of meat from any creature he strikes at. His tail is exceeding long, his eyes look very fierce and lively, are large, and of a greyish colour; his prey is swine's flesh, deer, or any thing he can take; no creature is so nice and clean as this in his food. When he has got his prey he fills his belly with the slaughter, and carefully lays up the remainder, covering it very neatly with leaves, which if any thing touches he never eats any more of it. He purrs as cats do: if taken young, is never to be reclaimed from his wild nature. He hollows like a man in the woods when killed, which is by making him take a tree, as the least cur will presently do; then the huntsmen shoot him; if they do not kill him outright he is a dangerous enemy when wounded, especially to the dogs that approach him. This beast is the greatest enemy to the planter of any vermin in Carolina. His flesh looks as well as any shamble's-meat whatsoever; a great many people eat him as choice food, but I never tasted of a panther, so cannot commend the meat by my own experience. His skin is a warm covering for the Indians in winter, though not esteemed among the choice furs. This skin dressed makes fine women's shoes or men's gloves.'

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* It seems to be the Mistli of Fernandez in the catalogue at the end of the work. The names Tlatlauhqui, Ocelotl, and Tlalocelotl evidently refer to the Jaguar.

We may here observe, without throwing doubt on other parts of Lawson's description, which is, generally speaking, confirmed by others, that, like many other writers, he has been too hasty in speaking of the irreclaimable nature of his animal. We can testify to the amiable qualities of the late Mr. Edmund Kean's 'Tom.' The Puma, so called, which belonged to this extraordinary actor was perfectly tame, and followed him about like a dog. Nor is this the only instance of the docility of this species. Mr. Bennett observe that in captivity the Puma readily becomes tame, and that his manners closely resemble those of the domestic cat; 'like it,' continues Mr. Bennett, 'he is extremely fond of being noticed, raises his back and stretches his limbs beneath the hand that caresses him, and expresses his pleasure by the same quiet and complacent purring. They soon become attached to those with whom they are familiar; and numerous instances might be mentioned in which they have been suffered to roam almost at large about the house without any injurious results.' (*Tower Menagerie.*)

Charlevoix ('Journal,' vol. i.) gives a rather curious account of the Carcajou[*] going a hunting with three foxes; and of his lying in wait on a tree for the elk and leaping down upon him as he passes under.

It seems to be generally agreed that the Puma is a most destructive species; for when it meets with a herd of animals it will slay in all directions, sucking only a small portion of blood from each victim. To sheep, fifty of which, it is said, to have been known to kill in one night, it is most destructive, and the squatter well knows the ravages that it will make among his hogs. Though an expert climber, it is said to haunt in South America the marshy meadow lands bordering on the rivers rather than the forest. In the Pampas it must affect the comparatively open country; for there, as we shall presently see, it[†] is commonly taken by the lasso. In the northern districts the swamps and prairies are its principal haunts; and its prey, where flocks and herds are not, deer principally, upon which it is said to drop in the manner described by Charlevoix with regard to the elk.

The chace of this animal is conducted, in different parts of the American continent, according to the prevailing manners of the people who go forth to hunt it. Thus Captain Head relates that as soon as the dogs unkennel a Lion[‡] or Tiger[§] they pursue him until he stops to defend himself. If the dogs fly upon him, the Guacho jumps off his horse, and, whilst he is engaged with the dogs, knocks him on the head with the balls; but if the dogs bay and do not go boldly in, the Guacho throws his lasso over him, and gallops off, dragging him along the ground, while the hounds rush upon him and tear him. In the north, he generally falls by the rifle, after he is 'treed' by the hunting party. Audubon gives a most lively account of an expedition of this kind, headed by a squatter on the banks of the Coldwater River, which ended in the Puma's death. The 'cougar,' or 'panther,' as Audubon terms him, was driven 'to tree' twice, and each time received balls in that situation. Several go in company generally, for when the infuriated animal has had to deal with one hunter only the consequences have been sometimes fatal to the latter.

Cuvier remarks, that as it would appear that this animal extends, or did extend, from California to Patagonia, he has been careful in his researches to discover whether there were not many species, or at least varieties, in this great extent of country; the conclusion at which he arrived was, that one species only existed.

The reader must bear in mind that there is another cat of a uniform colour, *Felis unicolor*, Traill, which is said to inhabit the forests of Demerara and is one half less than the Puma. The *Black Couguar*, *Felis discolor*, is allowed by some zoologists and rejected by others.

Puma. (Felis concolor.)

Sir William Jardine describes as the Black Puma an animal about 33½ inches long, without including the tail, which is about 13, and of which he gives a figure taken from a specimen brought in a merchant vessel to Greenock. He gives as synonyms *El Negro* of D'Azara and *The Black Cat of America* (Griffith's 'Synopsis'), both with a note of interrogation. Sir William adopts *Puma* as a genus, and gives the following species:—*P. concolor; P. nigra; P. Eyra; P. Pujeros; and P. Pajeros chalybeata.*

FOSSIL LIONS.

Remains of the *Felis Spelæa* of Goldfuss, *Höhlenlöwe*, or Lion of the caves, have been found in the caverns of Franconia, &c. For an account of the four great fossil cats, some as large as the Lion, enumerated by Professor Kaup from the Epplesheim sand, see FELIDÆ, vol. x., p. 224, and for a detailed list of fossil cats see that article and TIGERS.

LIP. [HARE LIP.]

LI'PARI ISLANDS, the antient Æoliæ Insulæ, or Liparæan Islands, are a group of small islands, situated between Calabria and the northern coast of Sicily, and between 38° 20′ and 38° 50′ N. lat. and 14° 10′ and 15° 13′ E. long. They are mentioned by the antient geographers as seven in number. Strongyle (now Stromboli), so called from its round form; Lipara, now Lipari; Hiera, or Vulcania, now Vulcano; Didyme, now Saline; Phœnicodes, now Felicudi; Ericodes, now Alicudi; and lastly Euonymos, which some think is the present uninhabited rock called Liscabianca, while others suppose it to be the inhabited island of Panaria. There are several other smaller islands, or rather rocks, such as Liscanera, Basiluzza, &c., which belong to the same group, but are uninhabited and barren. The principal islands are ranged as follows:—1, Stromboli, the most northern and the nearest to Calabria, is about 40 miles west of the Gulf of Sant' Eufemia: it consists of a conical mountain nearly 3000 feet high, which is a constantly burning volcano and has very frequent eruptions. It rises abruptly from the sea on all sides, except on the north-east, where the declivity of the mountain is more gradual, and allows of a cultivated space between it and the sea, which produces cotton and some wine, and is inhabited by about 300 people. The island is about 12 miles in circuit. The flames of the crater are a constant light to the sailors in that sea. 2. Panaria, about 10 miles south-west of Stromboli, is an extinct volcano, the crater of which slopes on one side to the sea-shore; the bottom or funnel of it is cultivated by a few individuals who are also fishermen. 3. Lipari, about five miles south-west of Panaria, the largest and most important island in the group, is a bishop's see, and the residence of a military governor; it is above 20 miles in circumference, and contains about 12,500 inhabitants. It has several mountains with volanic craters now extinct, though they emitted flames in the time of Strabo: it also contains mineral springs, and abundance of pumice stone, brimstone, lava, obsidian, and other volanic products. The land, which is very fertile, produces cotton, olives, and grapes, from which a luscious sweet muscat wine is made, called 'Malvasia di Lipari,' which, as well as dried raisins, forms an article of export. The inhabitants of Lipari are industrious. The town of Lipari, which has a harbour, is on the eastern coast of the island; it contains a castle, several churches, and some remains of antiquity. Lipari is said to have been colonized by Greeks from Cnidus; it was afterwards occupied by the Carthaginians, and became an important station for their fleets during their occupation of Sicily. During the first Punic war it came into possession of the Romans. It was ravaged by Khair Eddin Barbarossa in the year 1544, who took the town and carried all the inhabitants into slavery. 4. Two miles south of Lipari is Vulcano, with a crater, not quite extinct, which emits smoke; the island is barren and deserted. Strabo mentions three volcanic vents which might be considered as so many different craters; and he adds that the largest ejected lava. 5. Four miles north-west of Lipari is the island of Saline, 16 miles in circumference, with several villages, and about 4000 inhabitants. It consists of two mountains separated by a deep valley which runs from north to south, and being seen in that direction at a distance from the sea, it has the appearance of being divided into two islands, which is the origin of its name Didyme, or double. The valley is extremely fertile in wine, fruit, pulse, &c. 6. Ten miles west of Saline is Felicudi, or Felicuri, about 10 miles in circumference, with a few hundred inhabitants; it produces corn, fruits, and wine. 7. About eight miles west of Felicudi is the small island Alicudi, the most western of the Lipari group; it is hilly and not very productive, has some pastures, and about 200 inhabitants. In these two last-mentioned islands there is no appearance of any volcano. The best description of the Lipari Islands is that by Dolomieu, *Voyage aux Isles de Lipari*, in 1783; see also Ortolani, *Dizionario Geografico della Sicilia*, 1819; Houel, *Voyage Pittoresque de Lipari, Sicile, et Malte*, fol., 1782; Neigebaur, *Gemälde Italiens*; Strabo, p. 275; Pliny, *Nat. Hist.*, iii., 9.

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[*] Dr Richardson observes that Charlevoix applies the appellation of *Carcajou* to the Canada Lynx, the name of *Carcajou* being proper to the Wolverene, which mistake, the Doctor adds, has produced some confusion of synonyms among subsequent writers. Pennant refers to the passage given in the text, and says that Charlevoix by mistake calls the Puma *Carcajou*. See the articles GULO, LYNX.

[†] *P. Pajeros?* See post, opposite column.

[‡] Puma.

[§] The Jaguar is often called the *Tigre*. See also Hernandez, where it is named *Tigris Mexicana*.

The Islands of Lipari form part of the Intendenza, or administrative province, of Messina.

LIPPE, River. [RHINE.]

LIPPE. This principality probably derived its name from the river Lippe, on which the town of Lippe was built in the twelfth century. The ancestors of the family now reigning were reckoned in the twelfth and thirteenth centuries among the 'Primates Westphalorum,' and were the hereditary possessors of extensive countries. Bernhard von der Lippe obtained in 1127 the town of Lemgo from the emperor Lotharius; and he and his brother Hermann are mentioned for the first time with the title Von der Lippe in a document of the year 1129. Bernhard II., his son, a friend of Henry the Lion, appeared with a numerous retinue of well armed knights at the diet held at Mainz by the emperor Frederic I. In 1184 Bernhard III., obtained the lordship of Rheda by marriage in 1230. His grandson Simon I. inherited part of the county of Schwalenberg, and established in 1368 the *Pactum Pacis*, by which the eldest son only was to reign. Bernhard VIII., who died in 1563, was the first who took the title of Count von der Lippe. His son Simon VI. is the immediate founder of the present line. He divided his possessions among his three sons, of whom Simon VII., founded the line of Detmold, Otto (Otho) that of Brake, and Philip that of Bückeburg, or Schaumburg. The line of Brake becoming extinct in 1709, on the death of Louis Ferdinand, Count Adolphus of Lippe Detmold took possession of the country, without regarding the rights of Bückeburg, but the imperial Aulic council, by judgments passed in 1734 and 1737, assigned half of the country to Schaumburg Lippe, and the two houses concluded a convention in 1748.

LIPPE DETMOLD, consisting of the counties of Lippe and Sternberg, and part of that of Schwalenberg, forms a compact territory situated between 51° 45′ and 52° 10′ N. lat., and 8° 34′ and 9° 20′ E. long. It is bounded on the north-east by Schaumburg (more properly Schauenburg), belonging to Hesse Cassel; on the east by Calenberg (Hanover) and the county of Pyrmont; and on the north-east, south-east, south, and west by the Prussian province of Westphalia. The small bailiwick of Lipperode, with the town of Lippstadt (half only of which belongs to Lippe Detmold, and the other half to Prussia), lies detached, being entirely surrounded by Westphalia. The area of the principality is 435 square miles, and the population 80,000.

The country is mountainous but well wooded, and rich in the usual German products. The wooded chain Osning, commonly called by geographers the Teutobergerwald, commencing from the left bank of the Dimel near Stadtbergen in Westphalia, crosses the circle of Paderborn under the name of the Egge, and enters Lippe Detmold at Horn, whence it extends into the county of Ravensberg. The Osning, here called the Lippescher Wald (*i.e.* forest of Lippe), forms in the country three chains running parallel to each other from south-east to north-west, of which the first bounds the tract called the Senner Heath; the central one, which is the highest, contains the celebrated Extersteine, which are grotesque groups of sandstone rocks, where it is supposed that the antient German priests performed their ceremonies by moonlight; and the third is turned towards the valley of the Werra. The Osning divides the valleys of the Rhine and the Weser, the streams on the right running into the latter, and those on the left, for the most part, into the former river. The Weser, the only navigable river, just touches the northern frontier of the principality for a short distance, and receives the Emmer, the Exter, the Werra, the Bega, and some other small streams. The Ems rises at the foot of the Stapelagerberg, a branch of the Osning, crosses the Sennerheath, and soon enters the province of Westphalia. The Lippe merely touches the bailiwick of Lipperode and the town of Lippstadt. Vast forests of oak, beech, and other timber clothe the higher parts of the mountains, while on the slopes there is the finest arable land. The climate is temperate but not pleasant; the atmosphere is frequently loaded with fogs and vapours; the winter is cold and wet; the summer, especially in the Heath, very hot. The natural productions are corn, flax, hemp, potatoes, rapeseed, garden vegetables, and timber. The inhabitants have the common domestic animals, small four-footed game, poultry, feathered game, fish, and bees. The mineral products are plaster of Paris, lime, clay, marble, and freestone; and there is a salt-spring from which 36,000 bushels of salt are annually obtained. The staple productions are flax and timber, of which large quantities are exported. The breed of horned cattle is good, and sufficient for home consumption; that of sheep has been very much increased and improved of late years. Swine and goats are numerous. The horses bred on the Senner Heath are hardy and spirited, and are esteemed some of the best saddle-horses in Germany. There are no manufactures of any importance. Thread, coarse yarn, and linen are made in some parts, chiefly by the peasantry after their labours in the field are concluded; there are likewise several tanneries and brandy distilleries, two glass-houses, five paper-mills, and many oil-mills and saw-mills. The exports, besides flax and timber, are some cattle, linen, and Meerschaum tobacco-pipes manufactured at Lemgo.

The religion of the prince and the great majority of the inhabitants is Calvinism; but the inhabitants of Lemgo and Lippstadt, and a small portion of those of Detmold, in all about 5400, are Lutherans, and there are in the principality about 1600 Roman Catholics. The government is monarchical, with an assembly of estates consisting of 21 members, which, according to the constitution of 1819, introduced by the Princess Pauline as regent during her son's minority, has much more extensive powers than any other representative assembly in Germany. The public revenue is 490,000 florins. The contingent to the army of the German confederation is 690 men, and to the common treasury 250 florins per annum. Lippe-Detmold, with Schaumburg-Lippe, Reuss, Hohenzollern, Liechtenstein, and Waldeck, has the sixteenth vote in the diet, and in the full council one vote of its own.

Detmold, the capital, situated on the Werra, consists of the old and new town, of which the latter is very pleasant, and has some delightful public walks and gardens. The chief buildings are the palace, the gymnasium, and the theatre. There are a gymnasium, a seminary for schoolmasters, a school of industry, a Bible society, a society for the promotion of Christianity among the Jews, an hospital, &c. The number of the inhabitants is 2500. Lemgo on the Bega, a walled town with seven gates, has 4000 inhabitants, who carry on various manufactures, especially of woollen, linen, leather, and tobacco-pipes, of which the last is very considerable. The town has one Lutheran and two Calvinist churches, and a good gymnasium. Among the public buildings are two houses belonging to the prince, called the Lippenhof and the Annenhof, the nuns' convent built in the fourteenth century, and the orphan-house.

Schauenburg-Lippe consists of four bailiwicks in the county of Schauenburg and three in the county of Lippe, which are surrounded by Hanover, the Hessian part of Schauenberg, Lippe-Detmold, and Westphalia. It is 210 square miles in extent. The population is 25,000, who profess the Lutheran religion, except 3500 Calvinists in Alverdessen and Blomberg, and 100 Roman Catholics. The country, which is in general mountainous, has no rivers except small affluents of the Weser: the Stein-hude lake is about 5 miles long, 2½ broad, and at most 6 feet deep. The country produces corn, pulse, potatoes, turnips, rape seed, flax, fruit, timber, horned cattle, sheep, swine, goats, horses, poultry, game, and fish. Its mineral products are coals, stone, and lime. There are no manufactures, except some of thread and linen carried on by the peasantry. The revenue is 215,000 florins (about 21,000*l.* sterling). The country has had ever since 1816 an assembly of estates, which consists of 13 members, and meets annually. The chief town and residence of the prince is Bückeburg on the Aa, which has a population of 2427 inhabitants. There are a Lutheran and a Calvinist church, a gymnasium, an orphan-house, &c., but no remarkable buildings. Stadthagen, a walled town with three gates, has 1485 inhabitants. There are in the town a palace, which is the usual residence of the princesses dowager, a Latin school, and other public institutions; and the church, with the splendid mausoleum erected by Prince Ernest. In the neighbourhood there are coal-mines and considerable stone-quarries. Schauenberg-Lippe, as a member of the German confederation, has one vote in the general council and part of the sixteenth vote with Lippe-Detmold, &c. Its contingent is 240 men, and its payment to the treasury 250 florins.

(Von Donop, *Hist. Geog. Beschreibung der Lippeschen Lande;* Stein, *Geogr. Lexicon;* Hassel, *Handbuch der Erdbeschreibung.*)

LI'PSIUS, JUSTUS, was born at Isque, a village between Brussels and Louvain, the 18th of October, 1547. He was educated at Brussels, Cologne, and Louvain, and at the age of nineteen published 'Variæ Lectiones' of some of the principal Roman authors; this work was so highly esteemed by his learned contemporaries, that he was received with distinguished honour at Rome, whither he went in the same year, by the Cardinal Granvelle and Pope Pius V. After remaining two years at Rome he was appointed professor of history at Jena, where he resided till 1574. In 1579 he was appointed professor of history at Leyden, and took an active part in the ecclesiastical disputes of the times. During his residence at this place he professed the Reformed religion, but on quitting Leyden in 1591 he returned to the Roman Catholic church, in which he had been brought up, and published two treatises in defence of the worship of saints and their miraculous powers (*Diva Virgo Hallensis*, 1604; *Diva Virgo Sichemiensis*, 1605). He was afterwards professor of history at Louvain, where he remained till his death, March 24, 1606.

The works of Lipsius, which are very numerous, were collected and published at Antwerp in 1637; and also at Wesel in 1675; they consist of notes on the Latin authors, of which the commentary on Tacitus is the best, and is very useful; treatises on moral and political philosophy, and dissertations on Roman antiquities and historical subjects.

LIPU'RA, Illiger's name for the *Tailless Marmot* of Pennant. [Hyrax, vol. xii., p. 417.] Note, the species is marked as doubtful by Dr. Fischer, as far as regards *Hyrax*.

LIPU'RUS, a generic name given by Goldfuss to a species ? of Wombat (*Phascolarctos*), marked as doubtful by Dr. Fischer.

LIQUATION, or ELIQUATION, a process by which silver is sometimes separated from copper; it is an old method, which has fallen considerably into disuse on account of the trouble and expense attending it. When copper contains silver in the proportion proper for this operation, it is at a certain stage of the process of reduction mixed with lead, which has little affinity for the copper, but combines easily with the silver; the lead holding the silver is then worked off on a cupel in the usual way, and the silver is obtained separate. (Aikin's *Dictionary of Chemistry*, vol. ii., p. 367.)

LIQUIDAMBAR, a genus of plants of the natural family of Balsamifluæ of Blume, which has been altered to *Balsamaceæ* by Dr. Lindley. The name is derived from *liquidum*, fluid, and *ambar*, the Arabic name of amber. The genus is closely allied to the willow and plane tribes, but distinguished from both by its two-lobed, two-celled, many-seeded capsules, and their albuminous embryo. The species are only three in number, all forming fine trees, and occurring in Java, the Levant, and North America. *Liquidambar styraciflua* is the species found in Mexico and the United States, in the latter of which it is called *sweet gum*, and forms a large and fine tree, bearing some resemblance to the lesser maple (acer campestre): the wood is of a hard texture and fine grain, and makes handsome furniture, but the tree is more noted for the fragrant liquid resin which exudes from incisions in the stem, though not very copiously. This is called *liquidambar*, oil of liquidambar, and *copalm* balsam, which has a pleasant balsamic odour, and an aromatic bitter taste. This becoming dry and opaque, forms what is called *soft* or *white* liquidambar, which resembles very thick turpentine, has a feebler odour than the liquid balsam, and contains less volatile oil, but more benzoic acid. *L. orientalis* is a small tree, a native of Cyprus and other parts of the East Indies; was introduced into the Jardin des Plantes from Smyrna, and is said to occur along the Red Sea. Dr. Pocock, as quoted by Dr. Lindley, states that it is called Xylon Effendi (the wood of our Lord), in Cyprus, where it produces an excellent white turpentine, especially by incisions made in the bark. It is this substance perhaps which is alluded to in many works by the name *Rosa malla*, or *mallos*, described as a balsamic fluid produced upon the island of Cabross, at the upper end of the Red Sea near Cadess, which is three days' journey from Suez. But there are no recent accounts of this substance, which is thought by some authors to be procured from the following species.—*L. altingia* of Blume is a native of the forests of Java, at elevations of 2000 to 3000 feet above the level of the sea. It forms a gigantic tree, with bark having a hot and bitterish taste, yielding a fragrant balsam, or liquid storax, the *rasamola* of the Malayan Archipelago, though there is no proof that the liquid storax known in Europe is obtained from it, and it does not grow near the localities whence liquid storax has so long been obtained. It is therefore probable that some portion is obtained by boiling the branches of styrax officinale, or acting upon them with oil, spirit, or naphtha. [Styrax.]

The subject is interesting as connected with antient commerce, inasmuch as old writers mention a *liquid* with the *solid* storax. By the Arabs the former is described under the name *mia-saileh*, liquid storax; and the latter, *mia-yabseh*, solid storax. Both are described by Serapion under the head *Miha;* by Avicenna under the several heads of *Lubnee*, *Astaruk*, and *Miha*. The name *mia-saileh*, with the affix *rus* (juice), would appear to be the origin of the Malayan *Rasamola*. and thus one which has been variously corrupted.

LIQUORICE. [Glycyrrhiza.]

LIRIODENDRON. [Tulip Tree.]

LIRIS. [Campania.]

LISBON (LISBO'A, in Portuguese), the capital of the kingdom of Portugal, is situated on the northern bank of the Tagus, about nine miles above the bar or entrance of the river, in 38° 42′ N. lat. and 9° 5′ W. long. It rises in the form of an amphitheatre from the bank of the river, being built on a succession of hills, the highest of which are the hill of Buenos Ayres, or Estrella, to the west, and the castle-hill to the east. Most of the streets are steep, irregular, and tortuous, besides being ill paved and dirty. One part of the city however, which has been entirely rebuilt since the great earthquake of 1755, is regular and handsome; it lies on even ground in a valley which runs in a direction at right angles to the river, between the castle-hill to the east, and the hills of S. Francisco and Do Carmo on the west. This space contains about eight or nine well-built parallel streets, some of them, such as the Rua

Augusta, tolerably wide, and nearly half a mile in length, containing the best shops in Lisbon, especially those of the goldsmiths, silversmiths, and jewellers. These streets are crossed at right angles by other streets, and they terminate on the river side in a handsome square called Praça de Commercio, one side of which is formed by the Tagus, and the other sides by the arsenal, the custom-house, the exchange, royal library, and other public buildings. This square is adorned with a bronze statue of king Joseph I. At the opposite or north end of the above-mentioned streets are two squares, the Praça da Figueira, or market-place, and the Praça do Rocio, the latter of which is bounded on one side by the convent of S. Dominic and the massive buildings formerly occupied by the Inquisition. Farther north going towards the country is the Passeio Publico, or promenade, which however is small, and very inferior to the public gardens of other capitals.

The eastern part of the town, which lies at the foot of and beyond the castle, consists of narrow, irregular, ill-paved streets, with a neat house here and there. This is the oldest part of Lisbon, and the houses are high and old fashioned. It is remarkable that while the earthquake destroyed all the buildings in the valley, it spared the houses built on the steep declivity of the hill.

To the westward of the new streets the town rises on the steep declivity of a succession of hills, with a few good streets and open places here and there, especially along the river side, the rest of the streets being crooked, narrow, and filthy. Here and there are massive buildings, chiefly convents and churches, which crown the summits of the hills, and tower above all the rest. Lisbon being an open town like London, and its suburbs very long and straggling in various directions, it is not easy to define its limits. Its western boundary however is generally fixed at the stream of Alcantara, which falls into the Tagus, and from thence to the eastern extremity of the town the length in a straight line is between three and four miles, not reckoning the sinuosities of the ground; the depth of the town from the Tagus inland varies from one mile to a mile and a half, not including the long straggling lines of houses which extend along the approaches to the town. The whole of the area thus described is however far from being thickly covered with buildings; many parts are occupied by extensive gardens, plantations, the naked steep declivities of the hills, and by ruins and rubbish. The district of Buenos Ayres, along the slope of the western hill, is the least densely built, and contains many pleasant and healthy residences with gardens, which are mostly occupied by foreigners. West of the bridge of Alcantara a line of streets parallel to the Tagus connects Lisbon with the market-town and royal residence of Belem, or Bethlehem. [Belem.]

The Tagus from Belem up to the western end of Lisbon is little more than one mile in width, but opposite the centre of Lisbon it widens considerably, the left or southern bank turning suddenly to the south near the town of Almada, and forming a wide bay or reach about five or six miles in breadth, and extending far to the north-east. This bay gives to the river in front of Lisbon a sea-like appearance, which adds to the effect of the scenery. The southern bank, which is hilly about Almada, becomes low higher up the river, and is swampy at low water; it is however studded with small towns and villages, such as Aldea Gallego, Mouta, Alhosvedos, Lavradio, Barreiro, Coina, Seixal, Casilhas, Montella, and Almada. These places keep up a constant traffic with Lisbon, which they supply with fruits, vegetables, wine, &c., besides being the medium of intercourse between the capital and the southern provinces of the kingdom, and also with Spain by the post-road of Badajos.

The broad Tagus gives to Lisbon a most splendid and safe harbour, which might contain all the fleets of Europe. The largest men of war can anchor close to Lisbon. The entrance of the river is defended by two forts, St. Julian on the north bank, and Bugio on a small island opposite, which is joined to the southern bank at low water.

The most striking and imposing buildings of Lisbon are its vast and massive convents, which crown the hills, and look like palaces and fortresses; before the late suppression of the monasteries they gave to Lisbon a monkish appearance. The wealth of these convents and the number of their inmates have been much exaggerated by party writers ever since the time of Pombal. Those who wish to hear the other side of the question, or a reasonable defence of the monks, will find it in a well written work published at Lisbon in the early part of the present century, by a graduate of the university of Coimbra, styled *Os Frades julgados no Tribunal da Razao*, ('The Friars brought to Judgment before the Court of Reason'), which gives the statistics of Portuguese monasteries. But the late suppression, like all those effected since the French revolution, has been executed in a hasty unfeeling manner, and instead of relieving the public distress has added to it, by throwing thousands of individuals destitute upon society. By forbidding the admittance of novices, by opening the doors of the convents to all those who wished to leave them, and by uniting the remaining inmates of several convents of the same order into one, the suppression would have been gradual, beneficial, and effectual, and no injustice would have been perpetrated; but this process appears too slow to those who wish to coin money by the summary process of confiscation, a process however which history has proved to be ruinous to states, although it may enrich unprincipled individuals.

The population of Lisbon is very mixed, consisting of people from every province of Portugal, who resort thither in quest of employment, of a great number of blacks and men of colour from the colonies, and of numerous Gallegos, or porters and water-carriers from Galicia, and other foreigners. The lower classes live poorly, and are dirty in their appearance. The crowds of beggars and vagrants, who display their sores and other infirmities, are troublesome, disgusting, and dangerous. The police is still very imperfect, and the streets are but partially and imperfectly lighted at night. Lisbon is not provided with conduits or sewers, and all the filth is thrown into the streets, from which it is washed off by the rain into the river. (Kinsey, *Portugal Illustrated*, 1828; Captain Alexander, *Sketches of Portugal*, 1834.)

The climate of Lisbon is healthy and genial; it is very hot and dry in the summer months, when the heat is often 96° of Fahrenheit, but is relieved by north-west winds: heavy rains fall in November and December; cold clear weather prevails in January, but in February the weather becomes mild again, and the spring begins. Snow is a very rare occurrence.

A fine aqueduct, Os Arcos das Agoas Livres, supplies Lisbon with good water, brought from several springs situated near the village of Bellas, three leagues north-west of Lisbon. The aqueduct is in part conducted under ground; but on approaching Lisbon it passes across a deep valley, and the water is carried over a number of bold arches for a length of about 2400 feet. The water enters the town on the north-west at a place called Amoreira, where is the reservoir, from which the water is distributed to the several fountains about the town. The Gallegos draw water in small barrels from the fountains, and sell it from house to house, or cry it about the streets.

Olive and orange trees, cypresses and judas-trees, and some elms and poplars, are the trees seen in the neighbourhood of Lisbon. Orange-trees abound both in the quintas, or gardens, and also in open spots: they require much water, which is distributed by small troughs or channels which are supplied by water-wheels. The earth is heaped up at the roots, and the water is conducted between these heaps. The fruit is perfectly ripe in May, and continues till August. Oranges for exportation are gathered in February, before they are ripe.

The greater part of the country round Lisbon, particularly on the east and north sides, is covered with large gardens surrounded by high walls, which bound the view on every side. These gardens, called 'Quintas,' are often of considerable extent, and laid out rather for use than pleasure, generally containing plantations of orange and olive trees, and sometimes vineyards and even corn-fields. A pretty large house is attached to them, in which the families of the owners spend part of the summer. To the west of Lisbon the country is not so well cultivated; the hills are more rocky and naked; the soil consists of basalt, covered here and there with limestone: the basalt on which Lisbon is built extends to the north-west towards the market-town of Bellas already mentioned, and thence to the north as far as the Cabeça da Montachique, and to the south as far as the Tagus near Belem. (Link, *Travels in Portugal.*) Beyond Bellas, running north-east to south-west and terminating on the sea at Cabo do Rocca, rises a high range of mountains full of peaks, consisting of granite, partly covered with limestone. The south declivity of these mountains towards Lisbon is naked, and it is on the opposite or northern declivity that the delightful quintas and shady groves are situated which afford a summer residence to the wealthy inhabitants of Lisbon. [CINTRA.]

Leaving Lisbon for the north towards Torres Vedras there is a succession of suburbs or villages, such as Campo Grande, Carnide, Lumiar, Loures, &c., extending for several miles almost without interruption. The same occurs in a north-east direction along the banks of the Tagus towards Sacavem.

The population of Lisbon is reckoned at 260,000 inhabitants. Its trade, though much diminished since the loss of Brazil, is still considerable. It exports wine, fruits, and oil; and it imports corn, salt fish, salt butter, cheese, timber, iron, lead, tin, copper, coals, tar, and all sorts of foreign manufactures, with which it supplies the whole southern part of the kingdom. Lisbon has some manufactories of silks, paper, soap, and leather; its goldsmiths and jewellers are very expert; and there are also sugar refineries and potteries. We ought to observe here that the laziness and want of industry of the Portuguese have been much exaggerated by travellers.

The scientific and literary institutions are:—1. The Royal Academy of Sciences, founded during the reign of Queen Maria in the latter part of the last century. It is a most respectable association, and has published very interesting memoirs on the history, laws, and economy of Portugal, as well as upon its natural history and that of its colonies. 2. The College of the Nobles, a very handsome building, founded in 1761. 3. The Royal Academy of Marine, founded in 1779, or School of Navigation and Ship-building, with the observatory attached to it. 4. The Royal Academy of Artillery and Engineers, founded in 1790. 5. The Royal Military College. 6. The School of Music. 7. The Botanical Garden and Cabinet of Natural History at the royal residence of Ajuda, near Belem. 8. The Royal Library and that of the Necessidades. 9. The Royal Schools of Vicente de Fora, where philosophy, geometry, physics, and the antient languages are taught. 10. The Royal School of Drawing and Civil Architecture. There are also primary or elementary schools in the various districts of the city.

Society at Lisbon is rather dull: families live much among themselves; the Portuguese are not very fond of exercise, and their chief relaxation is going to their quintas in the summer. Carriages are scarce and old fashioned. The Italian Opera, or De Carlos, is a handsome house and much frequented. The Portuguese play-houses are small, and the performances not very choice. The best inns in Lisbon are kept by foreigners. There are some tolerable coffee-houses, and a number of tavernas, or wine-shops, and eating-houses, generally dirty and ill-provided.

The inhabitants of Lisbon, though mostly inclined to bigotry, are very tolerant towards foreigners, owing to their constant intercourse with the English and other Protestants, and have not that horror of heretics which is exhibited by the inhabitants of the inland parts of Spain.

(Kinsey, *Portugal Illustrated;* Miñano, *Diccion. Geog.;* Link, *Travels in Portugal*, a good work of the end of the last century; and other tourists. See also *Map of Lisbon*, by the Society for the Diffusion of Useful Knowledge.)

LISBURN, a parliamentary borough town, not corporate, situated partly in the barony of Upper Massereene and county of Antrim, and partly in the barony of Upper Castlereagh and county of Down, in Ireland. The parish, called likewise Blaris, extends also into the barony of Lower Iveagh, in the county of Down. The town is 73 Irish or 93 statute miles from Dublin, and 7 Irish or 9 statute miles from Belfast. The boundaries of the borough, as settled by 2 and 3 Will. IV., c. 89, comprise 1325 statute acres.

This town took its origin from the erection of a fortified mansion, about 1610, by Lord Fulk Conway, to whom a large part of the territory of Kilultagh had been granted by James I. These grants were enlarged and confirmed to Viscount Conway in the succeeding reign, during which the number of English and Welsh settlers in the town and neighbourhood greatly increased. The town was at this time called Lisnegarvey, and soon became a considerable place, as appears by the gallant and successful defence which it made against the Irish under O'Neill on the 28th November, 1641. The town and castle continued in the hands of the Royalists until 1650, when Sir Charles Coote took possession of the place for the parliament. On the Restoration, King Charles II., in consideration of the loyalty and services of the inhabitants, granted them a patent, dated 27th October, 1662, by which the church of Lisburn was erected into a cathedral for the united diocese of Down and Connor, and the inhabitants of the borough were empowered to return two members to the Irish parliament. On the revocation of the Edict of Nantes, Lisburn became the residence of a number of French refugees, who introduced the linen and damask manufacture, from which much of the succeeding prosperity of the place has arisen. A fire which occurred in 1707 burned down the castle and the chief part of the town. The castle gardens were then turned into a public promenade, and the town rebuilt in a more substantial and handsome manner. During the prosperous period which intervened between the time of the Irish volunteers and the rebellion of 1798 Lisburn increased rapidly. Since that time the town has rather declined, owing probably to the superior facilities for carrying on the linen and cotton-spinning trades possessed by the neighbouring seaport of Belfast.

The seneschal of the manor of Kilultagh is the returning-officer in elections for the borough, which, since the Union, is represented in the imperial parliament by one member. The number of electors in March, 1836, was 134. The right of election by act 2 and 3 Will. IV., c. 88, is vested in the 5*l*. householders.

The appearance of Lisburn is very pleasing. It is situated on a gently rising ground, on the north-western or Antrim side of the Lagan. The market-house occupies an open space in the centre of the town, where the three principal streets meet. It is a handsome building, with a cupola. Near the market-house is the church, an elegant edifice with a lofty spire, on each side of which the two streets leading towards Belfast and the old bridge over the Lagan diverge. The castle gardens are included between the former of these and the river, over which the walks and terrace command a fine prospect. The houses in the main street are chiefly built of English brick, and have a very elegant appearance. Those in the opposite or western end of the town are of an inferior description, and the suburb towards Moira is mean. Of 992 houses within the borough, 675 are roofed with slate, which is an unusually large proportion of that class of houses in an Irish inland town. The manor court-house, formerly a chapel for the French Huguenots, and the linen-hall, are substantial and commodious buildings. There are also three Presbyterian meeting-houses, one Methodist ditto, and one Roman Catholic chapel.

Lisburn is well paved, and is amply supplied with water by conduits to the houses. The provisions of the Lighting Act have not been applied. The constabulary force quartered in the town discharge the duties of municipal police. On an island in the Lagan, in the eastern suburbs, are extensive vitriol-works. Some of the largest bleach-greens for linen in Ireland are in the vicinity; and in the town are print-works for muslins, and a diaper and damask factory, much celebrated for the beauty of its fabrics. A navigation extends from the town by the river Lagan to the sea at Belfast, and by the river and a canal to Loch Neagh. A railroad is now nearly completed between Belfast and Lisburn, which is intended as the commencement of a line through Armagh to Dublin. This is the second work of the kind hitherto undertaken in Ireland.

In 1812 the number of houses in the borough was about 800, and the estimated number of inhabitants 4812. In 1831 the number of houses was 992, and of inhabitants 5745. In 1824 there were in the parish of Lisburn seven day-schools, educating 756 males and 548 females. Of these schools two were supported by the Association for Discountenancing Vice, and two others were partly supported by subscribers. The county infirmary is at Lisburn, and there are almshouses for fourteen females, supported by bequests, amounting in all to 2750*l*.

(*Survey of the County of Antrim*, Dublin, 1812; *Parliamentary Reports and Papers*, &c.)

LISCOV, CHRISTIAN LUDWIG, born at Wittenberg, 1701, although very little known in this country, still ranks high in Germany for his satirical writings, which, in their caustic irony, show their author to have had a congenial turn of mind with Swift. Very few particulars of his life have been recorded, further than that about the year 1739 he was private tutor at Lübeck, where a pedant named Sievers was the first who fell under the castigation of his pen. After this he became private secretary to

Geheimenrath von Blome, from which time nothing can be traced respecting him till he entered the service of Von Heinecker at Dresden. Under this accomplished and generous patron he might have passed his days in tranquillity, had not his love of ridicule prevailed over his prudence. Having offended the English minister at that court by some sarcasms, he drew upon himself the resentment of the all-powerful Count Bruhl, who caused him to be sent as a state prisoner to Eilenburg, where he died shortly after, October 30, 1760. Some however have questioned the truth of his having been in confinement.

Posterity has been more just to Liscov's merits than were his contemporaries. His satire was directed only against presumption and folly, and was besides far more general than personal, certainly impartial, and without any respect to persons, for a powerful offender was in his eyes no more than the meanest. That he possessed no ordinary ability for politics may well be conceived when we find Pott, the editor of a posthumous work of his, saying that had Count Bruhl listened to Liscov's advice, Germany would have been spared the Seven Years' War. The first complete edition of his works was published by Kriegrath Müchler, in 3 vols. 8vo., Berlin, 1806. Of several of these pieces the titles will convey some notion of the subjects: 'On the Excellence and Usefulness of Bad Writers;' 'On the Uselessness of Good Works towards Salvation;' and the 'Inaugural Discourse of the learned J. E. P., &c. at the Academy of Small Wits; together with the Reply of that eminent Society.' Liscov's own Apology for his satirical attacks is most admirable; and it may be remarked, that although satire seldom reforms those who are the immediate objects, it is nevertheless highly beneficial with respect to many who would else commit the same follies.

LISIEUX, a town in France, capital of an arrondissement in the department of Calvados, 93 miles west by north of Paris in a straight line, or 106 miles by the road through Evreux. This town existed at the time of the Roman Conquest, when it was called Noviomagus, or Nœomagus: it subsequently took the name of Lexovii, from the people to whom it belonged; and from this name the modern Lisieux is derived. It was pillaged by the Normans in A.D. 877; burned by the Bretons in A.D. 1130: and taken and retaken several times in the wars of the English in France, and in the religious dissensions of the sixteenth century. It was before the Revolution the seat of a bishopric; the bishop was a suffragan of the archbishop of Rouen.

The town stands on the right or east bank of the Toucques at the junction of the Orbec. The old walls have been lately replaced by some tolerably handsome buildings and a promenade. The streets of the town are tolerably wide; the houses are mostly of wood. The chief public buildings are the ex-cathedral, an antient edifice: the episcopal palace with its gardens, the seminary for the priesthood, and the great hospital. The population in 1831 was 10,257; in 1836 it was 11,473, showing an increase in five years of 1216, or above 10 per cent. The manufactures of the place are chiefly of broad-cloth, flannel, and other woollen fabrics; woollen and cotton yarn, and cotton goods; horse-cloths of wool and hair: leather, and brandy. There are bleaching and dyeing establishments. The trade, which is chiefly in the manufactures of the town, is promoted by the navigation of the Toucques, which commences at Lisieux. There are six yearly fairs. Besides the public institutions already noticed, there are several others, judicial or fiscal: also a high school and a theatre.

The arrondissement of Lisieux comprehends 348 square miles, and had in 1831 a population of 68,716, in 1836 of 69,844. It is subdivided into six cantons and 131 communes.

Among the former bishops of Lisieux, Jean Hennuyer deserves honourable mention: at the time of the massacre of St. Bartholomew he preserved the Protestants of his diocese. His kindness won over many of them to the Catholic faith.

LISKEARD, LESKEARD, or LESKERET, a parish, corporate town, and parliamentary borough, in the hundred of West and county of Cornwall, distant 218 miles west-south-west from London. The assessionable Duchy Manor of Liskeard includes the whole parish and borough. The charters of the borough are numerous, commencing with that of Richard, king of the Romans and earl of Cornwall, brother of Henry III., granted in the year 1240; the latest is of the 29th Elizabeth, and dated 26th July, 1587 The council consists of 4 aldermen, one of whom is the mayor, and 12 councillors. The revenue of the corporation for the year ending October, 1832, was 442*l.*, and its expenditure during the same period was 242*l.*; but in previous years the expenditure had considerably exceeded the revenue.

The town, which is meanly built, stands partly in a hollow and partly upon rocky heights, which give to the streets an appearance of great irregularity. Of late years the town has been much improved, and several persons, possessed of large properties, have decorated the immediate environs with excellent houses. The chief public building is the town-hall, erected about the beginning of the last century, at the expense of one of the members for the borough; it is a handsome structure, supported on granite columns. Liskeard still continues a place of considerable trade, and has an excellent market. It has been greatly benefited by the recent improvement of the roads in that part of Cornwall. The living is a vicarage, in the diocese of Exeter, possessing an average net income of 303*l.*, the rectory having been appropriated to the priory of Launceston. In 1304 the bishop of Exeter excommunicated the inhabitants of Liskeard, and put their church under an interdict, for refusing to pay tithes in kind on the ground of a composition between Earl Richard and the prior. (1 *Par. Roll*, 312.) An attempt was afterwards made to appropriate the vicarage also. (3 *P. R.* 505.) The population of the borough in 1831 was 2853 and that of the entire parish 4042; the parochial assessments for the year ending 25th March, 1829, amounted to 873*l.* Before the passing of the Reform Act, the corporation of Liskeard had returned two members to parliament continuously from the reign of Edward I. The borough, which consists of the parish of Liskeard and such parts of the old borough of Liskeard as are without the parish, now returns one member. For the history of Liskeard, as part of the duchy of Cornwall, see Manning's *Exchequer Practice*, 2nd ed., 374, 380; 1, 2, 3, and 4 Mann. & Ryl. *Rep.*, 141-2, 153, 177, 471-7; 2 Ventris' *Rep.*, 343. (*Parliamentary Papers;* Gilbert's *Parochial History of Cornwall.*)

LISLE, or L'ISLE. [VAUCLUSE.]

LISLE, WILLIAM DE, born at Paris 28th February, 1675, was the eldest son of Claude Delisle, a geographer and historian, under whose instruction he gave early proofs of a decided predilection for geographical pursuits.

Before the time of Delisle, the principal maps of authority were those of Nicholas Sanson, to whom geography is under many obligations; but these maps were exceedingly erroneous from the want of astronomical observations, although it does not appear that the author had fully availed himself of the few observations which really existed. After the death of Sanson, his sons continued to reproduce his maps with little or no alteration, notwithstanding that the more recent accounts of travellers and the observations of astronomers were greatly at variance with many of their positions. For this they were repeatedly censured both by La Hire and Dominic Cassini, to which however they seem to have paid little regard. At length, in 1696, Cassini drew a planisphere upon the pavement of the hall of the Paris Observatory, whereon he marked the position of 39 places according to their observed latitude and longitude, and thus exhibited the magnitude of the errors which vitiated the existing maps, and at the same time pointed out the means of effecting their improvement. Still however the geographical positions of by far the greater number of places could only be inferred from antient itineraries, and from the varied and often conflicting accounts of modern travellers, while the coast-lines had for the most part to be determined from a tedious comparison of the log-books of seamen. It is obvious that for a task of this description, in addition to the requisite scientific knowledge, which is comparatively of easy attainment, a person should be familiar with languages, and his reading must be sufficiently extensive to enable him to avail himself of all historical resources; he must be able to appreciate the changes which have taken place either through accident or fraud, in the measures of different nations, a problem of very considerable difficulty; but above all he must exercise a highly critical judgment in according to each statement a degree of confidence duly proportioned to its merits. With many of these qualifications Delisle was eminently endowed, and although he left ample room for the display of perhaps greater abilities in his successor M. d'Anville, there is no doubt that his own labours contributed powerfully to the improvement and extension of geographical knowledge. Four years after Cassini had exposed the enormous inaccuracies of the then existing maps, Delisle published (1670) four maps of Europe, Asia, Africa, and America, together with two globes about one foot in diameter, the one of the terrestrial, the other of the celestial sphere. In these the extent of several countries was so materially altered as to give to the earth an appearance altogether new. The length of the Mediterranean from the Straits of Gibraltar to the coast of Syria, instead of being 1160 leagues (3225 miles), was now limited to 860 leagues (2391 miles), or to less than three-fourths of its former length; the difference of longitude between the eastern and western boundaries of Asia was in like manner lessened by 25 degrees; and many other important corrections, which it is not necessary to enumerate, were introduced for the first time in these maps.

The reputation and profit which Delisle derived from these publications excited the cupidity of a man named Nolin, who, though distinguished by the title of geographer royal, did not hesitate to publish pirated copies of Delisle's maps, in which he purposely introduced a few slight errors, in the hope of thereby evading detection; and when taxed with the fraud, he retorted by ascribing the plagiarism wholly to Delisle. The latter was in consequence obliged to institute legal proceedings, less with a view to protect his interest than to clear his character of an unjust imputation. The result of the prosecution, protracted during six years, was in favour of Delisle, authorising him to seize and destroy the maps and plates of the defendant, a permission of which he partially availed himself.

In 1702 he was elected a member of the Royal Academy, and shortly afterwards was appointed geographical tutor to Louis XV., who conferred upon him the title of chief (premier) geographer royal, a title which did not previously exist, and which has since been conferred only upon M. d'Anville.

The maps of Delisle, in illustration of particular countries and of particular periods of history, now succeeded each other in rapid succession. Among them, the edition of his planisphere, published in 1724, is deserving of particular mention, as it shows the progress which had been made in geography before D'Anville had contributed considerably to its improvement. The latest edition of his maps, we believe, is that of 1789, published by Dezanche, in 2 vols. fol., and comprising 158 sheets. Besides these he has left an atlas of antient geography and an atlas of France divided into provinces. Such was his fame that most authors of respectability who wrote upon history or subjects connected with it, were desirous of having their works illustrated by his maps. The czar of Russia, the king of Sicily, and other European sovereigns are said to have made munificent offers in the expectation of inducing him to enter their service and to reside permanently in their dominions, but his attachment to his own country would not permit him to accept them. Peter the Great in particular was in the habit of paying him frequent visits during his sojourn at Paris, partly to give and partly to derive information respecting his own territories.

Delisle died at Paris, 25th of January, 1726. In the Transactions of the Royal Academy are printed the following memoirs bearing his name:—

'Observations on the Variation of the Needle with reference to Halley's Map,' 1710; 'Justification of the Antients in matters of Geography,' 1714; 'On the Longitude of the Straits of Magellan,' 1716; 'Geographical Determination of the Situation and Extent of the different parts of the Earth,' 1720; 'Geographical Determination of the Situation and Extent of the Countries traversed by Cyrus in his Expedition against his brother Artaxerxes, and of those traversed by the ten thousand Greeks in their retreat,' 1721; 'Remarks upon the Map of the Caspian Sea, sent to the Academy by the Empress of Russia,' 1721; 'Comparison of the extent of London and Paris, and some other cities both antient and modern,' 1725; 'On the Longitude of the mouth of the River Mississippi,' 1726. Besides the foregoing he had contemplated a work to be entitled 'An Introduction to Geography,' wherein he purposed giving an account of the alterations which he had introduced; but he died before its completion. The plan of the work was however made known by M. Fleret, in a small volume published by that gentleman in 1731.

(Fontenelle, *Oeuvres Diverses*, la Haye, 1729, tom. iii.; *Biographie Univers.*; Quérard's *Dictionnaire Bibliographique*.)

LISMORE, a bishop's see, late in the archiepiscopal province of Cashel, and now in that of Dublin, in Ireland. It includes portions of the counties of Waterford and Tipperary, and extends 37 statute miles by 38. The chapter consists of a dean, precentor, chancellor, treasurer, archdeacon, and 8 prebendaries. In 1792 the diocese was divided into 73 parishes, constituting 35 benefices, and having 22 churches. In 1834 the numbers were: parishes, 75; benefices, 43; churches of the Establishment, 36; other places of Protestant worship in connection with the Establishment, 1; and Roman Catholic churches, 65. In the latter year the total population of the diocese was 216,236, of whom there were 5970 members of the Established Church, 164 Presbyterians, 382 other Protestant Dissenters, and 209,720 Roman Catholics; being in the proportion of about 32 Roman Catholics to 1 Protestant. In the same year there were, in this diocese, 236 daily schools, educating 17,609 young persons, being in the proportion of 8·14 per cent. of the entire population under daily instruction; in which respect Lismore stands thirteenth among the 32 dioceses of Ireland. Of the above schools, 12 were, in 1834, in connection with the National Board of Education.

St. Carthag, commonly called Mochuda, of Ratheny in Westmeath, where he had a famous school, was the founder of the cathedral and school of Lismore, in A.D. 631. Cathaldus, afterwards bishop of Tarentum in Italy, succeeded. During his time and that of his predecessor, the school of Lismore was greatly celebrated for the number of its students; and the town or city is said to have been almost exclusively inhabited by ecclesiastics. Soon after the arrival of the English, the antient see of Ardmore was annexed to the diocese; and in the bishopric of Thomas de Reeve, who succeeded A.D. 1358, the see, so increased, was added to that of Waterford. By the 3 and 4 Wm. IV., c. 39, the see of Waterford and Lismore, being void, has become annexed to the united see of Cashel and Emly, and the temporalities are now vested in the Ecclesiastical Commissioners.

The town of Lismore is situated in the barony of Coshmore and Coshbride, and county of Waterford, on the southern bank of the Blackwater, three miles from the point where that river changes its course from east to south near Cappoquin. The Blackwater, opposite Lismore, is joined by the Owenshad, a rapid stream descending from the Knockmeledown mountains, which form a prominent object in the surrounding country. A handsome bridge, the centre arch of which has a span of 100 feet, crosses the main river a little above the point of junction, and leads to the town, which occupies the summit of the southern bank. At the eastern extremity of the town is the cathedral, a plain handsome building, with a tower and spire, boldly situated on the crest of the hill. It is in the later English style, and was chiefly built by the Earl of Cork in 1663. The castle, a magnificent pile, originally erected by King John in A.D. 1185, and greatly enlarged and strengthened by the first Earl of Cork, stands on the summit of a rocky bank, which rises to the height of nearly 100 feet above the Blackwater, at the opposite or western end of the town. Lismore is the property of the Duke of Devonshire, by whom it has been greatly improved of late. The town is also much indebted to the late duke, who built the bridge at a cost of 9000*l.*, and restored the castle, which had been reduced almost to a ruin during the civil wars of the seventeenth century.

Lismore was erected into a borough by charter of James I., and was represented in the Irish parliament by two members. The franchise was abolished at the time of the Union, and the compensation, amounting to 15,000*l.*, was paid to the trustees of the late Earl of Cork and Burlington. By the same charter, granted in 1613, the borough was incorporated; but the corporation is now defunct. The Blackwater is naturally navigable to within a mile of the town, and a canal has been constructed by the late Duke of Devonshire, by which lighters can now come up as far as the bridge. There is a small export of grain and flour; the imports are trifling, consisting chiefly of coal and timber brought by lighters from Youghall.

In 1831 there were in the town 366 houses and 2998 inhabitants. In 1834 there were in the parish of Lismore 22 day-schools, educating 705 males and 498 females. Of these schools two were chiefly supported by the dean and chapter, one by an annual grant from the Duke of Devonshire, one by an endowment by Lord Cork, and one by a grant from Sir Richard Musgrave

(Smith's *History of the County of Waterford*; Ware's *Bishops*; Beaufort's *Memoir of a Map of Ireland*; *Parliamentary Reports*, &c.)

LISSA, or *Polish Lissa* (in Polish, *Leszno*), a handsome town in the Prussian province of Posen, in 51° 52′ N. lat. and 16° 36′ E. long., belongs to Prince Sulkowsky, who has a palace there. It has two Calvinist, one Lutheran, and one Roman Catholic church, a large synagogue, a Calvinist Gymnasium Illustre, a Lutheran and a Roman Catholic school, and two hospitals and a theatre. Lissa is one of the most important manufacturing towns in the province. The principal manufactures are woollen cloths, linen, leather, hats, carriages, tobacco. The inhabitants, 8667 in number, of whom 3470 are Jews, carry on a very active trade.

LISSA, a village in Prussian Silesia and the government of Breslau, is celebrated on account of the victory gained in the vicinity, on the 5th of December, 1757, by Frederic II., at the head of 36,000 men, over an army of 90,000 Austrians and Imperialists, of whom 24,000 were made prisoners on the field of battle, 17,000 were taken in Breslau, which was forced to surrender after a short siege, and 15,000 were captured on the retreat of the remains of the army into the mountains. This battle is likewise called the battle of Breslau.

LISSA. [MAIIDÆ.]

LIST, CIVIL. [CIVIL LIST.]

LISTING. [ENLISTMENT.]

LITANY, a collection of prayers and supplications. The term is derived from the Greek (λιτανεία), and was adopted by Christian writers at a very early period. St. Basil tells us that Litanies were read in the church of Neocæsarea, between Gregory Thaumaturgus's time and his own: and St. Ambrose has left a form of Litany which bears his name, agreeing in many things with that in use in the Church of England.

In the Common Prayer Book of 1549 (the first book of King Edward), the Litany was placed between the Communion Office and the Office for Baptism, under the title of 'The Letany and Suffrages;' which book also directed it to be said or sung on Wednesdays and Fridays. In the review of the Common Prayer in 1552, the Litany was placed where it now stands, with the direction that it shall be used on Sundays, Wednesdays, and Fridays, and at other times when it shall be commanded by the ordinary. Till the last review, in 1661, the Litany was used as a distinct service, and followed the Morning Prayer; it was then directed and has ever since continued to be read as one office with the Morning Prayer, after the third Collect for Grace.

(Wheatley's *Rational Illustr. of the Book of Common Prayer of the Church of England*, 8vo., Oxford, 1810, pp. 163, 164.)

LI-TCHI, or **LEECHEE**, a fruit commonly sold in the markets of China, and occasionally brought to England, is the produce of the Euphoria Litchi of botanists, a tree belonging to the natural order Sapindaceæ. The eatable part is a pulpy flesh, which covers a stone enclosed in a hard, dry, tessellated, prickly pericarp. Another fruit, called the Long-yen or Longan, is yielded by another species of the same genus. The Chinese cultivate many varieties of each.

LITHARGE. [LEAD.]

LITHIC ACID. [URIC ACID.]

LITHIUM, a metal, the oxide of which was discovered by Arfwedson in 1817, and called *lithia* (from λίθος, a stone), from its occurring only in the mineral kingdom. It was first found in petalite and spodumene, minerals which occur in the iron-mine of Uto in Sweden, and it has since been discovered in amblygonite and lepidolite. These substances contain from about five to nearly ten per cent. of lithia in combination with silica, from which it is best separated by the following process of Berzelius: One part of petalite, or other mineral containing lithia, is to be mixed with two parts of fluor spar, both substances being finely powdered; the mixture is to be heated with three or four times its weight of sulphuric acid, as long as vapours are disengaged; the silica is expelled with the fluorine, and the alumina and lithia remain in combination with sulphuric acid; these salts are to be dissolved in water, ammonia is added to precipitate the alumina, the filtered solution is to be evaporated, and heated to redness, to expel the sulphate of ammonia, and sulphate of lithia remains, which, being treated with barytes, water is decomposed, sulphate of barytes is formed and separated, and pure lithia remains in solution, which, being evaporated, hydrate of lithia is left. Lithium is but little known. Davy obtained it from the above described hydrate by means of voltaic electricity, in the same way as he had previously procured potassium and sodium from their respective hydrates. Lithium was found to resemble sodium in its whiteness, but it was oxidized and reconverted to lithia with such rapidity, that its properties could not be minutely examined.

Oxygen and Lithium, it is evident from what has just been stated, combine with great readiness, and are separable with difficulty. Only one compound of these bodies is known, and that is the alkaline oxide *lithia*, which exists, as has been mentioned, in certain minerals, and also in the waters of Carlsbad, but in combination. Lithia, in its alkaline properties, in forming a hydrate with water, and in its chemical relations, is closely allied to potash and soda, and, unlike these alkalis, is not very soluble in water, but the solution resembles theirs in being caustic. It has not yet been obtained in the anhydrous state, so that when the solution is evaporated, hydrate of lithia is procured, which fuses at a low red heat, and on cooling concretes into a mass, which has a crystalline fracture: it does not attract moisture from the air.

The hydrate of lithia has not been analyzed, but from indirect experiments the oxide is concluded to consist of

One equivalent of oxygen . .	8
One equivalent of lithium . .	6
Equivalent	14

Chlorine and Lithium readily combine when the alkali is dissolved in hydrochloric acid; the solution, when evaporated to dryness and fused out of the contact of air, leaves chloride of lithium, which is a white semitransparent substance, very deliquescent, and soluble both in water and in alcohol. By evaporation cubic crystals are obtained, the alcoholic solution of which burns with a peculiar red flame. When strongly heated in the air, chlorine is expelled and oxygen absorbed, and the alkali lithia remains. It is probably composed of—

One equivalent of chlorine . . .	36
One equivalent of lithium . . .	6
Equivalent	42

Sulphur and Lithium, when obtained in combination by decomposing the sulphate of lithia with excess of charcoal, form an extremely pyrophoric substance.

Iodine and Lithium.—No compound of these is yet known.

Fluorine and Lithium form a fusible compound, prepared by dissolving lithia in hydrofluoric acid; it is difficultly soluble in water; the solution deposits small opaque crystals.

Acids and Lithia combine to form salts:—

Nitrate of Lithia is obtained by adding lithia to the acid. This salt is very deliquescent; when the solution is gently evaporated, crystals are obtained, which are sometimes needleform and sometimes regular rhombic prisms. Its taste is like that of nitre, it is extremely fusible, and becomes by heat as liquid as water. It is probably composed of—

One equivalent of nitric acid . .	54
One equivalent of lithia	14
Equivalent	68

Carbonate of Lithia.—When a strong solution of carbonate of ammonia is added to one of sulphate of lithia, a white precipitate of carbonate of lithia is formed. This salt is very slightly soluble in cold water; it is alkaline to test-papers, is decomposed by acids with effervescence, and has an alkaline taste. It is decomposed by lime and barytes, which separate the carbonic acid. It consists of—

One equivalent of carbonic acid .	22
One equivalent of lithia . . .	14
Equivalent	36

The waters of Carlsbad in Bohemia are stated to contain bi-carbonate of lithia in solution; and by spontaneous evaporation the carbonate separates in the state of a crystalline crust.

Sulphate of Lithia.—This salt is very soluble in water; it has a saline taste without bitterness, and crystallizes only in irregular masses. The air does not act upon it, and, unlike most of the salts of lithia, it is very difficult of fusion. It is composed of—

One equivalent of sulphuric acid .	40
One equivalent of lithia	14
	—
Equivalent	54

Phosphate of Lithia may be obtained by adding phosphoric acid to sulphate of lithia; no precipitate is at first formed, but on adding excess of ammonia an insoluble phosphate of lithia is thrown down: this property enables us to separate lithia from potash and soda.

Characters of Lithia and its Salts.—Lithia acts so readily upon platinum, that, according to Berzelius, this property will serve to detect a small quantity in any substance; for when it is heated with soda on platinum foil, the soda displaces the lithia, and the platinum round the fused mass assumes a colour more or less deep according to the quantity of lithia set free. Lithia is distinguished from soda and potash by its greater saturating power, as shown by its lower equivalent number; chloride of lithium is distinguishable from the chlorides of sodium and potassium by its solubility in alcohol, and the solution burns with a red flame. Its salts are not precipitated by chloride of platinum, as those of potash are; and, unlike both potash and soda, it forms a difficultly soluble carbonate and phosphate.

LITHODENDRON, a generic name of some Zoophyta, proposed by Goldfuss to include Caryophyllia and Oculina of Lamarck, and adopted by many geological writers in a rather vague sense. Blainville rejects the term. ('Actinologie,' p. 347.) The species ranked by Dr. Goldfuss in the group of Lithodendra offer many diversities of structure, and lie in strata of various antiquity ('Petrefacta Europæ'), especially in the transition and carboniferous limestones.

LITHO'DOMUS. [MYTILIDÆ.]

LITHOGRAPHY, the art by which impressions or prints are obtained by a chemical process from designs made with a greasy material upon stone. It has therefore been properly termed chemical printing, to distinguish it from all other modes of obtaining impressions, which are mechanical. In printing from an engraving on a copper or steel plate, the ink is delivered from the incisions made therein with the graver or etching-needle. An engraving on wood, on the contrary, gives its results from the projecting surface of the block, or those parts which are not cut away by the graver. The lithographic process differs from both these modes, the impressions being obtained (by strict attention to chemical affinity) from a level surface.

There are various styles of lithography, as will presently be seen; but the principle of the art is uniformly the same, being, as we have said, based upon those of chemical affinity.

The stone best calculated for lithographic purposes is a sort of calcareous slate, found in large quantities on the banks of the Danube in Bavaria. Stones much resembling the German have been found in some parts of Devonshire and Somersetshire, and also in Ireland; but we believe that on all the trials hitherto made, the stones found in this kingdom have been proved to want some of the most essential qualities of those brought from Germany, which are therefore almost exclusively used. Even these vary much in quality, all the strata not being equally good: some are too soft, and others are rendered unfit for use by the presence of chalk, flaws and veins, and fossil remains. A good stone is porous yet brittle, of a pale yellowish-drab, and sometimes of a grey neutral tint. The stones split into slabs varying from 1¼ to 2½ inches in thickness, which are then cut or squared into the different sizes necessary for use, and the face or upper surface of each is made level. In this state the stones are sent from the quarry; but further preparation is yet necessary to fit them for the immediate use of the artist, and they are either grained or polished, according to the nature of the work they are intended to receive. The mode of preparing a grained stone, as it is called, is this:—A stone, being laid flat on a table, has its surface wetted, and some sand sifted over it through a very fine wire sieve. Another stone is laid with its face downwards upon this, and the two are rubbed together with a circular motion, to produce the requisite granulation, which is made finer or coarser, to suit the taste or intention of the artist. The stones thus prepared are used for drawings in the chalk manner, or for imitations of those produced with the black-lead pencil. Great care is requisite in this mode of preparation, to keep the granulation uniform and the surface free from scratches, the presence of which would otherwise much disfigure the future work. Writings, imitations of etchings, pen and ink sketches, &c. require the face of the stone to be polished, which is effected by rubbing it with pumice-stone and water, or pumice-stone dust and water, applied with rags: no sand is used, as it would produce a grain.

The two principal agents used for making designs, writings, &c., on stone, are called lithographic chalk and lithographic ink. They are composed of tallow, virgin-wax, soap, shell-lac, and enough lampblack to impart a colour to the mass. These are incorporated by a peculiar process of burning in a closely-covered saucepan over a fire, and the whole is ultimately cast into a mould, and receives the form calculated to fit it for use. The ingredients are the same in the chalk and the ink, but the proportions are varied. The chalk is used as it comes from the mould in a dry state, but the ink is dissolved by rubbing, like Indian ink, in water, and is used in a pen or camel-hair pencil. It will be perceived that it is the presence of the soap in this greasy material which renders it soluble in water.

To render the lithographic process intelligible, let it be supposed that the artist now completes a drawing with the chemical chalk just described, upon a grained stone. If, while in this state, a sponge filled with water were passed over the face of the stone, the drawing would wash out, the chalk with which it is made being, as we have seen, soluble in water, by reason of the soap which it contains. Before therefore it is capable of yielding impressions, a weak solution of nitrous acid is poured over it, which unites with and neutralizes the alkali or soap contained in the chalk, and renders it insoluble in water. After this the usual course is to float a solution of gum over the whole face of the stone, and when this is removed, if a sponge and water be applied to its surface, as before supposed, the drawing is found to be no longer removable, because the chalk with which it is executed is now no longer soluble in water. In this state the work is ready for the printer, who obtains impressions by the following process.

Having thrown with the ends of his fingers a few drops of water on the stone, and spread them with a sponge, so as to wet, or rather damp, the whole surface equally, the printer finds that the water has been imbibed by the stone only on those parts not occupied by the drawing, which being greasy repels the water and remains dry. A roller properly covered with printing-ink is now passed over the whole stone, which will not even be soiled where it is wet, from the antipathy of oil and water. But the parts occupied by the drawing being, as we have seen, dry and greasy, have an affinity for the printing-ink, which therefore passes from the roller and attaches itself to the drawing. In this state it is said to be charged, or rolled in. Damped paper is then put over it, and the whole being passed through a press, the printing-ink is transferred from the stone to the paper, and this constitutes the impression. By repeating in this manner the operations of damping the stone and rolling in the drawing, an almost unlimited number of impressions may be obtained.

Now, as we have said, the modes of lithography are various, but the illustration just given will explain the principle of them all. It consists in the mutual antipathy of oil and water, and the affinity which the stone has for both, *i.e.* in its power of imbibing either with equal avidity.

It will be inferred that, to ensure complete success, great nicety is requisite in the preparation of all the agents employed in this art. Our limits will not allow us to go into details on the modes of manipulation, or the precise composition of the several materials used in making the design and taking therefrom the impressions. All the necessary materials for drawing, &c., on stone, in any style, are supplied by the different lithographic printers. Those who wish to study or practise the art in its full extent will do well to consult 'A Complete Course of Lithography,' by its discoverer, M. Senefelder, or 'A Manual of Lithography,' by M. Raucourt, both translated into English.

Imitations of etchings or pen and ink drawings, writings, &c., executed with the chemical ink upon a *polished* stone, are prepared and printed in precisely the same manner.

Transfer lithography, from the facility of its execution and its great utility, claims especial notice. A paper called '*transfer-paper*' is used to receive the writing in this mode of lithography. This paper has previously had a liquid gummy preparation washed over one side of it, which, when dry, constitutes its face, and the writing being performed with the chemical ink already described, rests upon this gummy surface, and does not penetrate to the paper beneath. When the writing or drawing done on the transfer-paper is dry, the back of it is wetted slightly but equally with a sponge and water; and the paper being very thin, the gum preparation on the front of it becomes at once partially dissolved. In this state the paper is laid, with its face downwards, on a *polished* stone, and being passed through a press, the transfer-paper is found strongly and closely adhering to it. The back of the transfer-paper is now well wetted, and, one corner being first raised, it will readily peel off, leaving the gum preparation, and of course also the writing which was above it, attached to the stone. The gum is then washed off with water, and the preparation and printing proceed in the manner already explained. This mode of lithography being eminently calculated to facilitate the despatch of business, its great utility has been sensibly felt in the commercial departments of the country, and in several of our government offices, as by its means one written despatch can be multiplied at pleasure, without delay or the risk of typographical errors.

Another style of lithography is commonly called '*etching*' or '*engraving on stone*,' although it must by no means be inferred that in this process the stone is incised, but that the results correspond with the clean-cut lines of the graver or etching-needle. A coat of gum-water, with some lamp-black or vermillion mixed with it, to give it colour and render the work visible, is thinly but evenly rubbed over a *polished* stone, and, when dry, effectually protects it from any application of grease. On this gum ground the design is executed with an etching-needle, precisely the same as in etching upon copper; and wherever the needle passes, of course the stone is laid bare, and it is best to cleanly remove the gum ground without cutting into the stone. After this some oil is rubbed over the whole surface, and is imbibed by the stone wherever the needle has passed and exposed its surface by removing the ground. The gum is then washed off, and the work may be at once rolled in and printed, without any previous acidulation.

Thus we see that grease anyhow applied to the stone will yield impressions, but that the character of the impression depends, 1st, on the *quality* of the grease; 2dly, on the *quantity* of grease; and 3dly, on the manner in which the grease is *applied*. As illustrations, we refer to the modes already enumerated, in which the application of the chemical preparation in the shape of a *solid chalk*, of *fluid ink*, and of *pure oil*, directly applied to the stone, have been pointed out, and the effects arising from each explained. It is the grease therefore which prints, and the lampblack introduced into the lithographic materials is of no other use than to enable the artist to judge of the quantity of grease imparted to the stone. That it does not in the slightest degree contribute to produce greater darkness in the impression, is proved by a very curious phenomenon. The design may be (and often is, in the progress of printing) washed out with turpentine, so as to become quite invisible; and a looker-on, unacquainted with the subject, would suppose the work to be completely destroyed; but it is the *black* only which has disappeared; the *grease* remains, and on being rolled in again, the drawing re-appears uninjured.

The variation in the quality of the tints, arising from the mode in which the grease is applied, may be further illustrated by reference to the *dabber*, which is an instrument by which tints of exceeding delicacy may be produced. It is made of very smooth leather, being somewhat round on its face, and stuffed with cotton wool. On the face of the dabber a lithographic preparation, softer than the chalk, is evenly and thinly applied with a hard brush, and afterwards imparted to the stone by repeated blows with the instrument. The dabber was formerly much in use, particularly for delicate skies; but as lithography has been longer cultivated among us, our artists have acquired greater manual dexterity, and produce tints of the greatest delicacy with the hand alone, which have the recommendation of standing better than those produced with the dabber.

The printing from two or more stones, although not a new discovery (since it was practised in Germany long since by Senefelder and others), has lately been more extensively practised in this country than heretofore. In this style the drawing is first made in the usual way, with chalk on a grained stone, but more slight, the sky and other delicate tints being omitted, and these are superadded from the '*tint stone*.' The tint is executed with facility by the printer on another stone (polished), with a modified preparation of chemical ink, and thus much labour is saved to the artist.

The extreme lights are then scraped out on this tint-stone, and the printer superadds the impressions from it to those already taken from the drawing on the other stone; of course taking great care that the two fit well, or '*register*,' as it is technically called.

Transfer lithography has been applied in other ways than the one already explained: indeed it would be difficult to fix limits to its capabilities, improvable as they may be in the hands of able chemists. Among the transfer modes, that of *printing copper-plate engravings from stone* is worthy of notice. An impression is taken on unsized paper from the copper-plate, and without delay transferred, by passing through a press, to a polished stone; it is then acidulated, and the printing proceeds in the usual way. The impressions thus obtained are scarcely distinguishable from those printed direct from the copper. The advantage which this application of lithography holds out is most apparent where economy or great despatch are important. These objects are both obtained by transferring impressions to several stones, or several impressions to one stone if the design be small, when the numbers can be multiplied with great rapidity, and without the original engraving being at all worn.

Plates of zinc have lately been much used as substitutes for the German stones, in chemical printing, and the practice is then called *zincography;* but excepting the difference of the material on which the work is performed, it is precisely the same art as lithography. Zinc plates have the advantages of greater portability, and of being less liable to break from the pressure in printing, but we have not seen any specimen which would warrant our saying that we think them equal to stone, for the best class of productions.

The purity of the *paper* used for lithographic printing is of very great importance, for however beautiful it may appear to the eye, if either acids or alkalis enter into its composition, or are used in the process of its manufacture, a circumstance of very frequent occurrence, they will certainly prove destructive to the lithographic drawing in the progress of printing. Hence arose a great obstacle during the early practice of lithography in this country. The increased demand for the article however has induced manufacturers to turn their attention to the subject, and papers are now produced for the express purposes of this art, which are free from the objections alluded to.

'Aloys Senefelder,' says Mons. Raucourt, 'an actor of one of the theatres at Munich, was the first to observe that calcareous stones had the property of receiving greasy lines and transmitting them to paper. He remarked that, by wetting the stone, it was possible to charge it again with ink, and obtain a series of impressions: he thus became the inventor of lithography.' Although it was long a practice to decry this art, it is hoped that its merits and advantages are now sufficiently felt to make it unnecessary for us to say much in its behalf. If, as a general principle, an original drawing is better than a copy, then is lithography entitled to the respect of all who desire the general improvement of the public taste; which must surely be consequent upon a process by which original drawings are multiplied almost without limits; for all lithographic impressions are original drawings, if they be not altered or spoiled in the progress of the printing. The excellence of lithography depends of course, like that of all other arts, upon the skill with which it is performed; and the facility with which drawings are executed upon stone, and impressions of some sort obtained from them, has led to a glut of worthless productions, and a consequent feeling of disgust towards the art in the public mind. It must be admitted that considerable uncertainty attends the result, even when the work is conducted by the best hands; for a variation in the quality of the stone, or any of the materials employed, or even in the temperature of the weather, produces considerable changes in the impressions. But with all these drawbacks, the fine specimens which have been produced are sufficient evidence that, even as a branch of the fine arts, it is every way worthy of esteem; while the commercial advantages of its lower departments, such as the transfer mode, have never been denied or questioned. Our object has not been to enter into minute details, but to explain the *principles* upon which lithography is founded, and to show broadly their application to the different modes or styles; beyond this we have deemed it sufficient to refer to works from which more copious information may be obtained. For an account of the construction of lithographic presses see PRESS.

LITHO'LELAPS. [CIRRIPEDA, vol. vii., p. 208.]

LITHONTRIPTICS (λίθος, a stone, and τρίβω, to rub or bruise), medicines or other means which are thought to possess the power of dissolving stone or calculus in the urinary organs. The calculous concretions which are apt to form in the kidneys or bladder are of very different kinds, originating in different constitutions or in different habits of life or locality of abode. They are also different, not only according to the time of life when their formation began, but they often become varied in the progress of their increase, and are different in the strata of which they are composed.

It requires therefore not only very close investigation into the characters of the urine of a person supposed to be affected with calculous concretion, but also no slight acquaintance with the chemistry and physiology of that fluid, and the great influence of the nature of the food and drink on its composition, to be able to direct the use of medicines which are regarded as lithontriptic. With few exceptions, their employment has been nearly empirical; and aggravation of the case has as frequently resulted as benefit from their employment. The researches of recent chemists and pathologists have given something approaching to a scientific explanation of the circumstances under which calculi form, as well as of their varied characters; so that more good may reasonably be expected from the use of lithontriptics than has hitherto been realised. [CALCULUS.]

Of the twelve or thirteen varieties of calculous concretions which have been discovered in the bladder or kidneys of the human subject, some are of very rare occurrence, while the more common ones may be classed under two distinct heads—those which form under the prevalence of the uric or lithic acid state of constitution, and those which form under the prevalence of the phosphatic state of constitution. These sometimes alternate, and indeed the concretions which belong to the last class have almost invariably a nucleus or centre of the first kind, which shows how very important it is to avoid the causes of the lithic acid formations.

Independent of constitutional peculiarities, the leading causes of the formation of calculous concretions are errors in diet or regimen. The kidney is the great channel for the expulsion from the system of the azotized or nitrogenous principles of the blood, as well as of many saline particles, which were once an integral part of the body, but now effete; and to keep these in suspension, so as to ensure their elimination from the body, a due quantity of an aqueous menstruum is required. Hence whatever reduces the quantity of urine below the proper standard predisposes to the formation of calculi. Now an excess of animal food, particularly if exercise be neglected, and strong wines—in a word, rich living, with indolent habits—are the frequent origin of calculous complaints. Crude vegetables, with bad clothing and exposure to cold and damp, which interfere with the healthy action of the skin, equally predispose to the formation of stone, and thus the poor suffer from it as well as the wealthy. The causes being so widely different, the mode of treatment must also be different. A specific cannot therefore exist, and all unskilful tampering with a case must lead to most hurtful results. Medicines taken by the mouth have been hitherto more successful in relieving the distressing symptoms (and such alone can be used where the stone is in the kidney) than solvents thrown into the bladder. There is however ground for believing that in certain cases, under competent direction, chemical agents and perhaps galvanism may be made available to dissolve the concretions in the bladder. (See Brodie, *Lectures on Diseases of the Urinary Organs*, 2nd ed., and particularly the very excellent work of Dr. Willis, *Urinary Diseases and their Treatment*, 1838.)

LITHOPHA'GIDÆ, a name applicable to all marine *Conchifera, Mollusca, Radiata*, &c., that penetrate stones, masses of madrepore, and other hard corals, forming therein a nidus for themselves; but more particularly applied to the *Conchifera*. Whether the perforation be effected by chemical erosion or mechanical action is at present undetermined. Some observations on this part of the economy will be found in the articles CLAVAGELLA (vol. viii., p. 263), and GASTROCHÆNA (vol. xi., p. 94): others will occur in giving the natural history of *Lithodomus*, *Pholas*, &c., as well as in treating of the species noticed in this article. The erosion is not confined to the *Conchifera* only; for *Patella* has the power of perforating certain rocks to a limited extent: nor to the *Mollusca* generally; for some of the *Echinidæ* (*Radiata*), for instance, are known to make shallow basin-like lodgements in the rocks whereon they dwell. We shall here only refer to one of the last discussions on this subject which took place at a meeting of the Zoological Society in October, 1837. At that meeting Mr. Gray called the attention of the Fellows to some pieces of chalk which he had recently found in the cliffs at Brighton, exhibiting perforations made by the *Patella* and *Pholas*, and presenting appearances which he considered to have been produced in the case of the latter genus by the rotatory action of the valves. His remarks elicited much discussion as to the manner in which certain molluscous genera penetrate limestone rocks and other hard substances, a phenomenon which Mr. Owen thought could not be explained upon the supposition of its being exclusively caused by the rotation of the valves, but that it was chiefly due to the mechanical influence of the currents of water produced by the vibratile *cilia* of the animal, as noticed by Mr. Garner in a communication 'On the anatomy of the *Lamellibranchiate conchiferous* animals,' made to the Society in 1833. (*Zool. Proc.*, 1833, 1837.) This very interesting paper, beautifully illustrated, is published in its perfect state in the 'Transactions' of the Society, vol. ii., and the observations alluded to by Mr. Owen are well worthy the attention of the practical as well as the Zoological reader, for the subject is of high importance practically; as those who are interested in such great public works as the Plymouth Breakwater well know. If this paper should meet the eye of any one so situated as to be able to make a course of experiments relating to the perforations of the marine *Lithophagidæ* and *Xylophagidæ*, and the mode of protection from their attacks, we hope that the inquiry will be patiently followed out. Should the experimentalist succeed, he would be a public benefactor generally, and to this country, where so many submarine works are carried on, both in wood and stone, especially.

Besides the species above alluded to, and others noticed in Mr. Garner's memoir, to whose observations we shall advert in the proper place, certain crustaceans [LIMNORIA] possess the power of perforating wood at least. Excavation is also apparently carried on by the following marine animals. 'Certain *Annelides*,' says Mr. Garner, in the concluding paragraph of his observations on this part of the subject, 'apparently possess this power of excavation. The rocks on our coast are pierced by a minute worm, probably of the genus *Diplotis* of Montagu; it is strongly ciliated, but its mouth does not appear adapted for making its way into such hard substances. By the currents excited by *Vorticellæ*, &c., it is that the erosion noticed at the beaks of fresh-water bivalves takes place; the laminæ at that part being soft and more distant from each other. We find the valves of the *Oyster*, *Pecten*, *Lutraria*, &c., perforated by small circular apertures leading into internal cavities. Dr. Buckland showed this to depend upon the action of a *zoophyte*, which Professor Grant has particularly examined, and named *Cliona celata*. Dr. Buckland considers the holes to be formed by little borers, which the *polypes* possess; these however do not exist, and I believe the phenomenon to be caused by the action of the *cilia* of the animal.' We have introduced this paragraph, that those who may be led to make the inquiry above alluded to may be aware that there are minute animal agents constantly at work to aid in the work of destruction, though their operations are feeble when compared with the ravages made by the *Lamellibranchiate conchifera* in stone and wood, and by *Limnoria* in the latter substance.

We proceed in this article to the examination of those excavating lamellibranchiate conchifers to which a reference has been given from CONCHACEA, as well as to the consideration of *Saxicava*.

Venerupis.

This form is placed by Mr. Garner in that section of the *Dimyaria* (with two adductor muscles) which is distinguished by having the *branchiæ* united medianly; and the characteristic of *Venerupis*, as given by the same author, is to have the *tubes* large, and the *foot* short and prominent behind.

Generic Character.—*Animal* oblong, rather thick, having the borders of the mantle simple, slightly open before for the passage of a compressed and elongated foot; tubes two in number, rather long, united in a considerable portion of their length, and having their orifices radiated; branchiæ little and unequal; labial appendages very small.

Shell solid, striated, or radiated, a little elongated, gaping posteriorly, more or less irregular, equilateral, very inequivalve, the anterior side being always shorter than the posterior side, which is generally truncated as it were, the other being more or less rounded; umbones marked, nearly contiguous; hinge composed of slender, approximated, and nearly parallel teeth, two in the right valve, and three in the left, or three in each; posterior ligament a little elongated, and in great part external; muscular impressions oval, the posterior one the most rounded, both united by a pallial impression deeply excavated posteriorly.

Such is the character given by M. Rang, who apparently restricts the generic name to those species which excavate stones, &c. 'The shells,' says M. Rang, 'which compose this genus are lithophagous, and excavate in stones and madrepores cavities more or less proportioned to their form and to their volume, wherein they lodge themselves, and out of which when adult they cannot go, the aperture of the excavation being too small to admit of their egress. They are without an epidermis, and generally of a dirty white.'

M. de Blainville, who knew not the animal when he published his 'Malacologie,' divides the genus into three sections: the first exemplified by *Venerupis Irus*; the second by *V. Rupellaria* (genus *Rupellaria*, Fl. de Bell.); third, by *V. lamellosa*[*] (genus *Petricola*, Lam.); and he remarks that if the system of 'engrenage' of the species of excavating *Veneres* be regarded rigorously, we should be compelled to establish as many genera as there are species. He adds that he has chosen *Venerupis* from among the denominations proposed for some of these genera, because it well indicates that the species composing it are *Veneres* of the rock.

Mr. G. B. Sowerby (*Genera*, No. xxviii.) notices the difficulty of ascertaining any distinguishing character between the Lamarckian *Venerupis* and the *Veneres Pullastra*, *decussata*, and others, except in the apparent habits of the animals; a difficulty which had prevented him from endeavouring previously to clear up a point to which his attention had been frequently directed, but which he thinks he has at last overcome. 'It is well known,' continues Mr. Sowerby, 'that *Venus perforans*, Mont., *Venerupis perforans*, Lam., and some of its congeners, live in cavities perforated in chalk and limestone rocks, and that the *Veneres Pullastra*, *decussata*, and several other species that resemble them in general form and appearance, are found buried in the sand; an apparently well marked difference therefore exists in the habits of their respective animals; we think however that we have evidence to prove that there exists in reality very little difference, and that the cavities in which Lamarck's *Venerupes* live are rather the natural consequence of the action of the sea-water in conjunction with some of the excretions of the animal upon the chalk or limestone, than of any power of the animals themselves to pierce independently of such action; so that the difference is really only in the nature of the shore on which the very young shells are accidentally deposited, those which are thrown upon a sandy bottom burying themselves in the sand, and such as are deposited upon limestone or chalk producing a cavity in which they live.' Mr. Sowerby then proposes to unite together under one appellation Lamarck's *Venerupes*, and the following of his *Veneres*:—*V. Malabarica*, *papilionacea*, *adspersa*, *punctifera*, *turgida*, *litterata*, *sulcaria*, *Textile*, *texturata*, *geographica*, *rariflamma*, *decussata*, *Pullastra*, *aurea*, *virginea*, and some others: and for the genus thus constituted he proposes the name of *Pullastra*, rejecting the term *Venerupis*, or *Venerirupis*, because it would convey the false idea that at least the greater number of the species were inhabitants of rocks. [VENERIDÆ.]

M. de Blainville and M. Rang, as we have above seen, restrict the genus *Venerupis* to the species that excavate rocks.

Lamarck makes his *Lithophages* consist of the genera *Saxicava*, *Venerupis*, and *Petricola*; and quotes the opinion of M. Fleuriau de Bellevue that boring shells generally do not pierce stones by the attrition of the shell against the stone, but by means of a softening or dissolving liquor which the animal sheds a little at a time.

Lamarck observes that it is not his intention to assemble under this family of *Lithophages* all the boring bivalves, or all that pierce stones; for, as he truly says, such an assemblage would be rather extravagant. He refers to shells equally excavating with his *Lithophages*, which cannot be separated, some from the *Veneres*, others from the *Modiolæ*, others from the *Lutrariæ*, others again from the *Carditæ*, and remarks that it is not of these that he is then treating. His *Lithophages* consist of those shells, among the boring or excavating conchifers, that gape more or less anteriorly, and have the posterior side short, rounded, or obtuse, with the ligament of the valves always external, which live habitually in stones, and for the reception of which he then knew no particular family, or any family to which they might conveniently be approximated. He observes that he nevertheless places among them some species the habits of which were not known to him. To this M. Deshayes adds in the last edition (1835) a note stating that upon the same ground that it would not be rational to establish a genus or family for the *Modiolæ*, or the *Carditæ*, which pierce stones, it would not be right to reject from the family of the *Lithophages* shells which do not perforate, but wherein we nevertheless find all the essential characters of the species which it contains. For this reason it would be convenient to approximate the *Byssomyæ* and the *Hiatellæ* to the *Saxicavæ*, and to leave in this genus species which do not perforate. M. Deshayes (loc. cit.), who does not appear to have seen the observations of Mr. Garner and Mr. Owen above alluded to, refers to the discussions relative to the means by which perforation is brought about by certain acephalous mollusks. Some authors, he remarks, have supposed that the attrition of the valves against the stone sufficed to wear it away by degrees, and that thus the animal formed a lodgement sufficient to contain it. Olivi, he observes, who was of this opinion, grounded it on the fact that he pretends to have observed that perforating mollusks can attack lavas or other rocks which are not calcareous. 'Since this assertion of the Italian author,' continues M. Deshayes, 'no well made observation has occurred to support it, whilst, on the contrary, a great number of proofs have been collected showing that perforating mollusks are never lodged except in calcareous stones.[*] This mode of life renders very probable the opinion of M. Fleuriau de Bellevue, who believed that the animal was provided with an acid secretion, by means of which it dissolved, in proportion to its growth, the walls of the cavity which it inhabits. An observation of my own is that the greatest number of perforating mollusks are contained in close fitting cavities by no means made to permit of rotatory motion; that they are oval when the shell is of that form; and that we almost always see rising between the umbones of the valves a calcareous crest which forbids any movement of rotation.' M. Deshayes then proceeds thus:—'Many zoologists have believed that there was but little necessity for preserving the family of the *Lithophages*. M. de Férussac places the *Saxicavæ* in the neighbourhood of the *Gastrochænæ* and the *Solens*, and he places the *Venerupes* near the *Veneres*. M. de Blainville has adopted a nearly similar opinion: we do not admit it any more than that of M. de Férussac, and we shall preserve the family of the *Lithophages* as Lamarck established it in this work. We rest our opinion on the knowledge of many animals belonging to the three genera *Saxicava*, *Petricola*, and *Venerupis*; they are bound by a common relationship (par des rapports communes); thus the mantle, which scarcely opens for the passage of the rudimentary foot in certain *Saxicavæ*, opens a little more in the *Petricolæ*, and more still in the *Venerupes*. The foot follows a nearly analogous development, always remaining however proportionally smaller than in other mollusks in which this organ is necessary for locomotion.'

Lamarck says of the *Venerupes*, or Venuses of the rock, that they seem in fact to have a hinge analogous to that of the *Veneres*, but that nevertheless a slight difference in the disposition of their cardinal teeth suffices to enable us to recognise the genus. They are, he adds, lithophagous or perforating shells which are very inequilateral, and which are not distinguished from *Petricola*, except in having three cardinal teeth, at least, in one valve.

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[*] See a note by M. Deshayes (last edit. of Lamarck) to V. Irus, pointing out error here.

[*] But see CLAVAGELLA, where a calcareous grit is recorded as being perforated; and the observations of Mr. Garner post (Saxicava).

'The greater part of the *Venerupes*,' observes M. Deshayes in his commentary on this genus, 'differ scarcely from the *Petricolæ*; they offer most frequently three cardinal teeth in one valve, two and rarely three in the other. When in some individuals one of these teeth is abortive, which often happens, the same species may be comprised in the two genera at once. The animals of the perforating *Venerupes* are scarcely to be distinguished from those of the *Petricolæ*; only the mantle is a little more slit and the foot a little longer. In the *Veneres* these parts are different; and this proves that it is necessary to keep separated two genera which Cuvier and M. de Blainville have thought it right to unite or approximate. We do not pretend to dispute, nevertheless, the analogy which is evidently exhibited between certain *Venerupes* and the *Veneres*. We think that the *Venerupes* only ought to be withdrawn from the genus and placed among the *Veneres*, because the animals are in fact similar; only some plunge themselves into hardened mud, whilst others live in the sand. And although they may enjoy the faculty of perforating stone, this would not be a sufficient reason to reject them from the *Veneres*, because we have seen that in a great number of genera belonging to very distant families there exist perforating species; thus we may well conceive that there may be perforating *Veneres*, but that does not hinder us from admitting a genus *Venerupis*, the characters of which appear sufficient to us.'

The number of recent species of *Venerupis* is not great; Lamarck gives seven, and M. Deshayes adds one.

Geographical Distribution.—The range of *Venerupis* is wide; we have species on the coasts of England and France, in the Mediterranean, in the South Seas, and in those of New Holland.

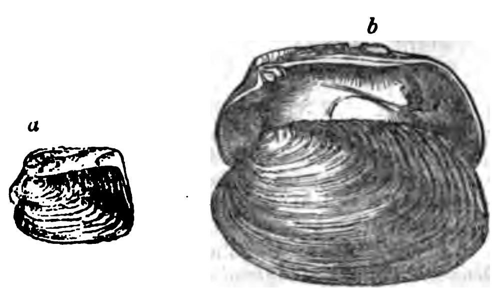
Habits.—See above: it is a littoral genus.

Example, *Venerupis perforans.*

Description.—*Shell* subrhomboidal, concentrically striated, running into strong wrinkles or ridges at the anterior side; sometimes, though very rarely, with very fine longitudinal striæ; colour light-brown; *umbo* very near to one end, small, and turned a little sideways; the longer side much truncated; hinge with three teeth in each valve, one of which is small, the others long, slender, and curving outwards; middle tooth a little bifid. Inside smooth, white, with generally some purple at the truncated end; margin plain; valves moderately concave. Length rarely exceeding 3-8ths of an inch, breadth more than 5-8ths.

Montagu, whose description this is with very slight alteration, says, that with respect to shape it is difficult to fix any as a permanent character; it is however, he adds, most frequently subrhomboidal; sometimes nearly as long as it is broad, generally strait on the front margin, but in some instances deeply sinuous or indented.

Locality.—Coasts of England. Lamarck records a variety smaller and narrower, with substriated lamellæ, from the coasts of France, on the authority of M. Fleuriau de Bellevue.



Venerupis perforans. *a*, from Montagu's figure; *b*, from the shell.

Fossil Venerupis.

M. Deshayes, in his tables (Lyell), makes the number of living species eight and of the fossil species (tertiary) six. He also quotes *Venerupis Irus* as being found both living and fossil (tertiary). He does not however note *V. Irus* as fossil in the last edition of Lamarck (1835), and only gives these two fossil species, *V. globosa* and *V. striatula.* M. de Blainville gives the number of fossil *Venerupes* as five.

Petricola (Lam.; including *Rupellaria*, Fl. de Bell.).

Generic Character.—*Animal* oval, thick, especially at the upper part; mantle with simple borders which are a little dilated in front, where they form a rather small opening for the passage of a tongue-shaped and feeble foot; tubes small, in the shape of cones, truncated at their summits, separated for two-thirds of their length, and finely radiated at their orifices; branchiæ small.

Shell rather delicate, without an epidermis, white, radiated, oval, subtrigonal, gaping anteriorly, more or less irregular, equivalve, inequilateral, the anterior side much shorter than the posterior side; umbones not projecting much, and contiguous; hinge composed of small cardinal teeth not diverging much, one of which at least is bifid, to the number of two in one valve, and one in the other, or two in each; ligament external, posterior, short, and convex; muscular impressions oval, united by a pallial impression which is often not very distinct, and has a very deep and rounded excavation posteriorly. (Rang.)

Mr. G. B. Sowerby observes ('Genera,' No. xv.) that the genus *Petricola*, as it stands at present, is composed of several shells which Lamarck thought sufficiently different to form two genera, his *Petricola* and *Rupellaria*, the first with two cardinal teeth in one valve and one in the other, the second with two teeth in each valve; but Mr. Sowerby entirely agrees with Lamarck in the propriety of uniting them. He is not so well satisfied with the place assigned by Lamarck to this and some other genera which form the hollows in stone wherein they dwell; and he thinks that a great degree of similarity in external figure and appearance as well as habit should have brought them nearer to the *Pholadariæ*.

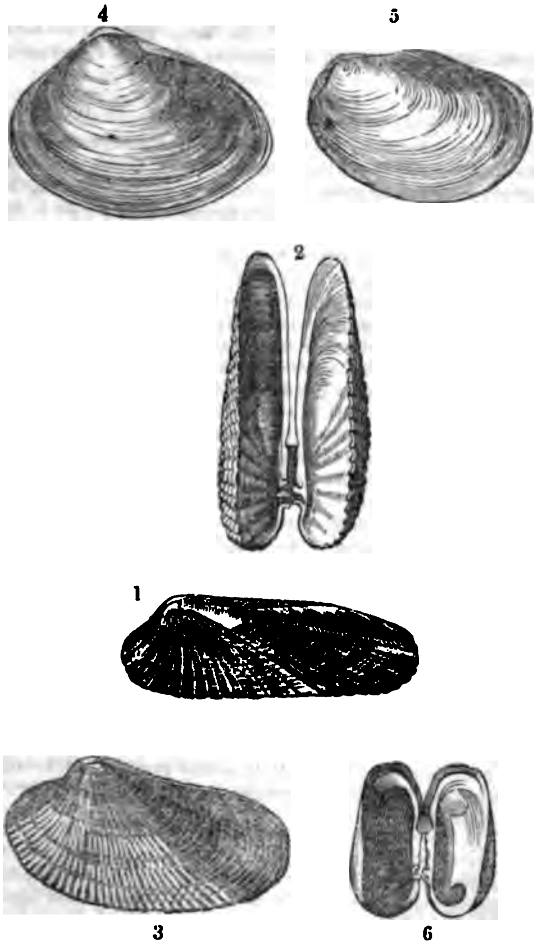
M. Deshayes, in a note to the last edition of Lamarck, is also of opinion that the latter did well in uniting *Petricola* and *Rupellaria*, which exhibit in fact so little difference, that the same species may be placed under either the one or the other genus, according to the state of development or preservation of the hinge. M. Deshayes goes further, and says that perhaps we shall be obliged hereafter to unite *Petricola* and *Venerupis*, which in reality differ but little from each other. This resemblance, he adds, exists not only in the shells but also in the inhabiting animals. Mr. Garner appears to be of the same opinion, for in his 'Anatomical Classification of the Lamellibranchiata,' we find the genus *Venerupis*, to which he evidently gives a very large extent, but no mention of *Petricola*.

Geographical Distribution.—Nearly coequal with that of *Venerupis*, as far as the localities of that genus are recorded; and rather numerous on the coasts of the warmer parts of America. (Cuming.) Also found on the Gallapagos Islands. (Cuming.)

Habits, &c.—Much the same with those of *Venerupis*, in the same rock with which, and in its close neighbourhood, *Petricola* is often found. Mr. G. B. Sowerby speaks of the cavities in which they live as being evidently of their own working, though on account of their form they cannot possibly have been produced by a rotatory motion, for they are exactly of the shape of the shell itself, and a very little larger. *Petricola* has been found at depths ranging from the surface or near it to a depth of eleven fathoms.

The species are not few. Lamarck recorded eleven recent, two of which occur also in a fossil state; and two entirely fossil. M. Deshayes does not add to the number of recent species, in fact he expresses his belief that *Petricola Linguatula*, one of Lamarck's, ought to be arranged among the *Saxicavæ*; nor does he admit Mr. G. B. Sowerby's *Petricolæ Dactylus* and *subglobosa* ('Genera') into the last edition of Lamarck. The ten new recent species brought to England by Mr. Cuming, and described by Mr. G. B. Sowerby in the 'Proceedings of the Zoological Society' for 1834, were probably not published when the 6th volume of the new edition of Lamarck went to press. M. Deshayes however adds two fossil species, *P. elegans* and *coralliophaga*.

The difference of form is so great in this genus, that we have thought it advisable to give, with permission, representations of the following species from the 'Genera,' by Mr. G. B. Sowerby, instead of the description and figure of one species.



1, and 2, Petricola Pholadiformis. 3, P. Dactylus. 4, P. Ochroleuca. 5, P. rupestris. 6, P. subglobosa. (Sowerby.)

Fossil Petricolæ.

The number of recent species given by M. Deshayes in his tables (Lyell) is 13, but some more, as we have seen, have been described since. The number of fossil (tertiary) he places at 10, and gives the species *ochrocleuca*, *lamellosa*, and *striata* as both living and fossil (tertiary). Dr. Fitton, in his 'Stratigraphical and Local Distribution' of the fossils in the strata below the chalk, records and figures two species (*canaliculata* and *nuciformis*) from Blackdown.

Coralliophaga. (*Cypricardia*, part, Lam.)

Generic Character.—Animal unknown.

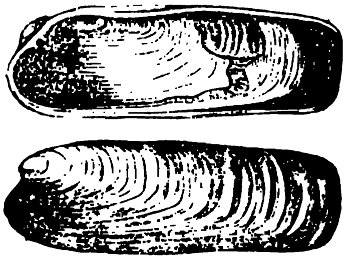
Shell oval, elongated, finely radiated from the summit to the base, cylindrical, equivalve, very inequilateral, the dorsal summits very anterior and but little developed; hinge consisting of two small cardinal teeth, one of which is subbifid, in front of a sort of lamellar tooth, under a rather weak external ligament; two muscular impressions, which are small, rounded, and distant, united by a narrow pallial impression, a good deal excavated posteriorly.

M. de Blainville established this genus for some species of living shells placed by Lamarck among his *Cypricardiæ*, and which appeared to the former to be approximated to the *Veneres*. M. de Blainville states that M. Deshayes had caused him to remark shells of the same species as that cited by M. de Blainville as the type, and which had modified their form so as to resemble a *Lithodomus* in which they had lived.

M. Rang thinks that this genus is well distinguished from the *Cypricardiæ*, because, in one part, the excavation of the muscular impression announces that the animal has tubes, whilst the other shows that it perforates.

Example, *Coralliophaga carditoidea*, Blainv.; *Cypricardia coralliophaga*, Lam.; *Cardita Dactylus*, Brug.; *Chama coralliophaga*, Gmel.

Locality and Habits.—In the masses of madrepores and other corals at St. Domingo. M. Rang observes that it is in the masses of madrepores so common at the Antilles that the species of this genus should be sought for.



Coralliophaga carditoidea.

Fossil Coralliophagæ.

The species here figured as recent is also noted by Lamarck as fossil in Italy, under the name of *Cypricardia coralliophaga*.

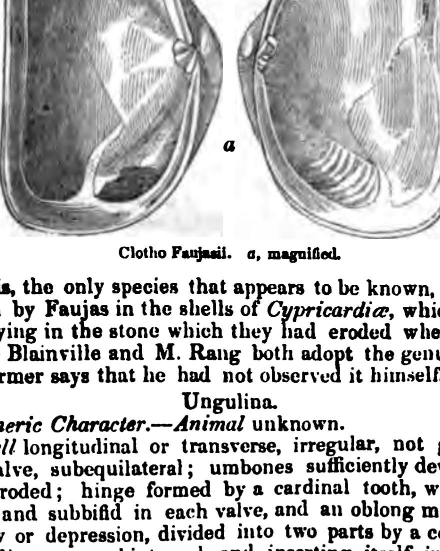
N.B. With regard to this genus the reader should bear in mind that M. Deshayes, who, in the last edition of Lamarck, gives *Coralliophaga carditoidea* of De Blainville as a synonym of *Cypricardia coralliophaga* of Lamarck, says, in a note to the succeeding species in Lamarck's 'System,' 'These three last species'—*Cypricardia rostrata*, Lam., *C. coralliophaga*, and *C. modiolaris*, the first of which M. Deshayes considers to be identical with its antecedent species *C. angulata*, Lam.—'are found fossil in the great oolite of France and England. Lamarck, who had not seen their hinge, referred them, from their form, to the genus *Cypricardia*; but I, more fortunate, possess separate valves, from the hinge of which I have cleared away the stony matter, and have remarked that these shells have all the characters of *Crassina*, the genus to which I refer them.'

Clotho. (*Fossil* only.)

Generic Character.—Animal unknown.

Shell oval, subregular, striated longitudinally, equivalve, and subequilateral; hinge formed of a bifid tooth, curved back into a hook, rather longer in one valve than in the other; ligament external.

Example, *Clotho Faujasii*.



Clotho Faujasii. *a*, magnified.

This, the only species that appears to be known, was detected by Faujas in the shells of *Cypricardiæ*, which were still lying in the stone which they had eroded when alive. M. de Blainville and M. Rang both adopt the genus; but the former says that he had not observed it himself.

Ungulina.

Generic Character.—Animal unknown.

Shell longitudinal or transverse, irregular, not gaping, equivalve, subequilateral; umbones sufficiently developed and eroded; hinge formed by a cardinal tooth, which is short and subbifid in each valve, and an oblong marginal furrow or depression, divided into two parts by a contraction; ligament subinternal, and inserting itself in these depressions; muscular impressions elongated; pallial impression not flexuous. (Rang.)

Geographical Distribution.—M. Rang notes the locality as unknown in his 'Manuel;' but the locality for *Ungu-*

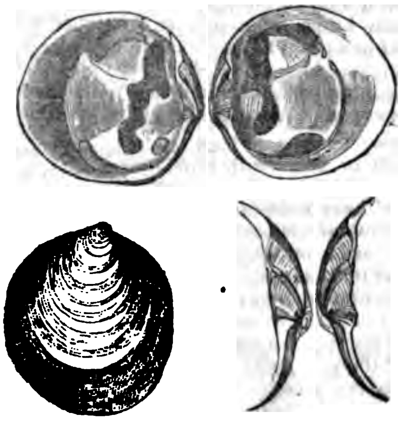
lina transversa, given in Lamarck (last edit.), is 'the seas of Senegal,' on the authority of the former. Mr. G. B. Sowerby has also received specimens from Senegal, and says he has good reason to believe that they are marine.

The latter naturalist observes upon this genus, that it was established by Daudin and adopted by Lamarck, but is at present almost unknown in this country. He states that in general form and appearance these shells very nearly resemble the *Lucinæ*, and gives it as his opinion that the two species recorded by Lamarck are only accidental varieties of the same.

M. Deshayes does not think that the characters of this genus were well appreciated by Lamarck, and remarks also on its close approximation to the *Lucinæ*. The ligament, he observes, is not internal, as Lamarck thought, but external, and received, as in many *Lucinæ* and *Cythereæ*, upon very flattened *nymphæ*, separated by a deep furrow, in which the most superficial part of this ligament inserts itself. He is also of opinion that the two species recorded by Lamarck (to which in the last edition he has not added) are varieties of one only.

Habits.—M. Deshayes states that observations recently made by M. Rang have shown that the *Ungulinæ* are perforating shells, which, he says, he had already known from a fossil species in the environs of Bordeaux.

Example, *Ungulina transversa.*



Ungulina transversa.

Fossil Ungulinæ.

M. Deshayes, in his tables, records one living species of *Ungulina*, but notices none in a fossil state. It will be seen above that he speaks of a fossil species from Bordeaux in the last edition of Lamarck.

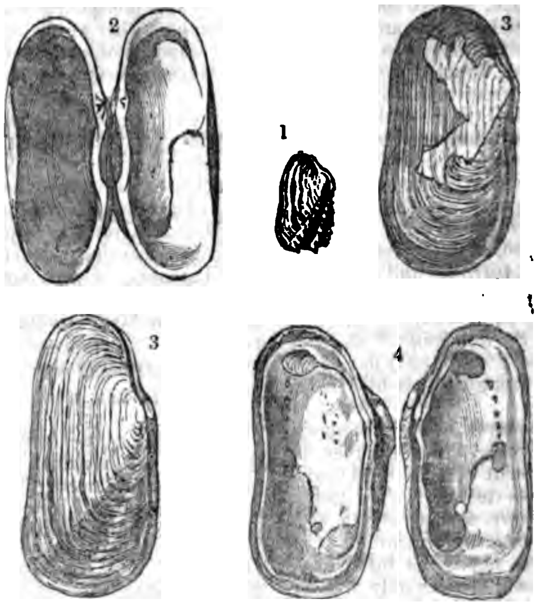
Saxicava.

Generic Character.—Animal elongated, subcylindrical, having the mantle closed on all sides, prolonged backwards by a long tube, double internally, a little divided at its summit, and pierced inferiorly and anteriorly by a rounded orifice for the passage of a small, elongated, delicate, and pointed foot; mouth moderate, labial appendages small; branchial laminæ for the most part free, and very unequal on the same side.

Shell thick, solid, covered with an epidermis, elongated, rounded in front, truncated as it were posteriorly, gaping, irregular, equivalve, very inequilateral, the posterior side being much longer than the anterior; umbones not very distinct; hinge without teeth or with two separated tuberosities more or less developed; ligament external; muscular impressions rounded and a little approximated, united by a small straight pallial impression, very narrow, and occupying the middle of the valve. (Rang, from *Saxicava rugosa.*)

Both M. de Blainville and M. Rang place the genus among the *Pylorideans*. The former is of opinion that it differs but little from *Glycimeris*.

Mr. G. B. Sowerby ('Genera,' No. xxv.) includes in the genus *Saxicava* shells which, he observes, have had, in conformity with the various views of authors, at least six different generic names. He apologises for the conclusion to which he has come in contradiction to so many great authors, but gives the following reasons for his opinion. He premises that it will not be disputed that *Solen minutus* of Chemmitz and Montagu, *Hiatella arctica* of Daudin, *Cardita arctica* of Bruguière, and the *Byssomya* of Cuvier, are one and the same species; and that Leach's *Pholeobius* includes as distinct species of the same genus the *Solen minutus* of Montagu and the *Mytilus rugosus* of Linnæus; 'now the former of these,' continues Mr. Sowerby, 'is *Hiatella arctica* of Lamarck and Turton, and the latter *Saxicava rugosa* of the same authors: thus all the six genera are reduced to one by Dr. Leach, whose authority is indisputably very great in such matters: we do not however propose to our readers to take it as conclusive, but will state that we possess, as Dr. Leach did, a series of specimens, the young ones of which are more regular in shape and more strongly spinose than the older, and are to all intents and purposes *Hiatella arctica*, or *Solen minutus;* and the older specimens, losing the strongly-marked double rows of spines, though always retaining indications of them, and assuming a much less regular form, become characteristic specimens of *Saxicava rugosa:* the hinge teeth of the younger specimens may be advanced as an argument against the identity of these shells: it is however well known that in many shells, particularly those that are irregular, the teeth become obsolete with age: thus if the hinge teeth, the general form of the shells, or the double row of spines, cannot be depended upon as generic distinctions, the Lamarckian genera *Hiatella* and *Saxicava*, and his *Solen minutus*, merge into one: to show that the shells described as distinct species under either of these generic names are identical is not important to the present work; it is therefore sufficient to observe, that in all irregular shells that are either found attached to or imbedded in rocks, corals, roots of sea-weeds, &c., the general form cannot be taken as a character; and we believe the *Mytilus præcisus* and several of the *Saxicavæ* described by Lamarck and Turton to be merely variations of *S. rugosa*, than which there is perhaps no shell more subject to variety of form.' To illustrate this exposition, Mr. G. B. Sowerby gives in his 'Genera' the following figures of *Saxicava rugosa* in different stages of its existence.



Saxicava rugosa.

1, the young shell; 2, inside, showing the teeth; 3, a full-grown specimen of the same; 4, the inside, showing the muscular impressions.

M. Deshayes observes, in the last edition of Lamarck, that the latter knew but a very small number of *Saxicavæ*, and has not mentioned any fossils, of which last there are eleven or twelve species. 'When,' continues M. Deshayes, 'we examine the shells of *Byssomya*, and compare them with those of *Saxicava*, we find no difference between them; whilst in the animals a much greater discrepancy exists, because the *Byssomyæ* do not perforate, and carry, behind a rudimentary foot, a byssus, like that of the *Mytili;* the mantle is closed for a good part of its length, and is prolonged backwards into two siphons joined together to the summit. If we appreciate these differences at their just value, we may easily perceive that they are not of so great importance as they appear to be; for a byssus is a method of living in the same spot (en un même point), as well as the faculty of penetrating stones, We must consider the character of the byssus in the *Byssomyæ* as of little value; for the greater number of zoologists have united this genus to the *Saxicavæ*.' M. Deshayes then goes on to observe that Lamarck has comprised the same species under two very different genera, and that his *Solen minutus* and *Hiatella arctica* are the same shell; to be satisfied of which, one has only to compare the synonym. 'The fact is,' he adds, 'that the shell in question is not a *Solen*, and ought not to constitute a particular genus; for it belongs to the byssiferous *Saxicavæ*, as we have satisfied ourselves that it does by an examination of the animal.'

M. Deshayes further observes, in a note to *Saxicava Australis*, that all shells which, like those of this genus and the two following (*Petricola* and *Venerupis*) are cramped in their development, put on different forms, so as to impose upon the most acute observers, especially when the observation is confined to a small number of individuals. This happened, he adds, to Lamarck, who has given to the same shell the names of *Corbula Australis*, *Saxicava Australis*, and *Saxicava veneriformis;* so that in a well executed catalogue it would be necessary to unite these three species under one name, and arrange them among the *Saxicavæ*.

Geographical Distribution.—Very extensive. The Northern Ocean, the Britannic seas, the Mediterranean, the South Seas, Australasia, and the warmer coasts of America, are recorded as localities.

Habits, &c.—Mr. G. B. Sowerby remarks that the *Saxicavæ* are frequently found upon the outside of oysters, protected by their irregularities, and in clefts of rocks or corals, roots of sea-weeds, and perforating oysters, chalk, limestone, and hardened clay. Those, he adds, which themselves perforate the hollows in which they live are more regular than others.

Mr. Garner states that the crypts of *Saxicava* are not circular: hence M. de Bellevue and Mr. Osler, in this instance, believe them to be formed by the phosphoric acid secreted by the animal, and they suppose this animal to inhabit those rocks only which are composed of carbonate of lime, which last supposition Mr. Garner declares to be not correct to his own knowledge.

Mr. G. B. Sowerby observes that the species of this genus are not numerous, and that they are not easy to distinguish from each other, as the reader may imagine from the confusion which has prevailed on this subject. Lamarck recorded five species. Of the first two of these (*Saxicava rugosa* and *S. Gallicana*), one, according to M. Deshayes, must be suppressed, being in reality only a variety of the other. *Saxicava Australis* and *S. veneriformis*, Lamarck's fourth and fifth species, are identical, as we have already seen. To these M. Deshayes adds *S. Guerini*, from the Mediterranean, and *S. rhomboides?* as recent species. Mr. G. B. Sowerby (*Zool. Proc.*, 1834) has added three recent species collected and brought home by Mr. Cuming.

Fossil Saxicavæ.

Lamarck, as we have above noticed, characterized no fossil *Saxicavæ*. M. Deshayes, in his tables, gives the number of recent species as 5; and 11 as the number of fossil species (tertiary). He notes two species, *S. minuta* and *S. Pholadis*, as both living and fossil (tertiary). We do not find *S. minuta* recorded at all in the last edition of Lamarck (1835), nor is the fossil designation added to *S. Pholadis*. Of fossil species only five are recorded, unless we regard *Saxicava rhomboides* (Desh.) as fossil only, which the synonyms (*Donax rhomboides*, Poli, *Solen minutus*, Linn., and *Hiatella arctica*, Lam.) seem to forbid. There is no recent 'habitat' given; but there can be little doubt that it is identical with the living and fossil *S. minuta* of the tables of M. Deshayes.

The reader will bear in mind that the ravages of the stone-excavating genera noticed above, though considerable when they congregate in numbers, are superficial in comparison with the destructive operations of *Pholas* and *Lithodomus*.

LITHOSTROTION, the name given by Llwyd, and adopted by Fleming, to some fossil 'madrepores,' as the lamelliferous corals are commonly termed, which appear confined to the older strata (especially mountain limestone). They are included in Cyathophyllum of Goldfuss by Professor Phillips (*Geol. of Yorkshire*, vol. ii.), and in Columnaria by Blainville (*Actinologie*, p. 350).

LITHO'TRYA. [CIRRIPEDA, vol. vii., p. 208.]

LITHO'TOMY (from λίθος, a stone, and τέμνω, to cut). Although urinary calculi may be extracted from the kidneys, urethra, or bladder, the term lithotomy is restricted to the operation of cutting into this latter viscus for the purpose of removing one or more stones. From the complex nature of the fluid secreted by the kidneys, and the quantity of saline matters which it holds in solution, deposits not unfrequently take place in one or other of the cavities to which the urine has access. Hence solid concretions, or urinary calculi, may be met with in the kidneys, ureters, bladder, or urethra; but the majority of these concretions are believed to be formed originally in the kidneys. Now, if we suppose one of these calculi to have descended into the bladder, it is easy to imagine that it would there form a nucleus, around which the addition of fresh matter would be constantly adding to its bulk. A priori reasoning would lead us to suppose such to be the result, and that this actually takes place is proved by the fact that many calculi have for their nucleus foreign bodies that have accidentally entered the bladder, as bullets, splinters of bone, bits of bougie, &c. The number and size of calculi met with in the bladder differ as much as their form and composition vary, and their magnitude is generally in an inverse ratio to their number. A case has lately been recorded in which 398 calculi, from the size of a pea to that of an olive, were found in the bladder after death; while, in a case described by the late Sir James Earle, a stone was extracted after death which weighed forty-four ounces, its long axis measuring sixteen inches, and the shorter fourteen; but the average size of vesical calculi is about that of a walnut. Their form is mostly spheroidal, or egg-shaped, and sometimes flattened on two sides like an almond.

According to their composition, they are either soft and friable, or very dense and hard, and their surface may be quite smooth or beset with numerous tubercles. These circumstances, together with their loose or fixed position in the bladder, have considerable influence in determining the comparative severity of the symptoms. Children and aged persons are more subject to the disease than those in the vigour of life, and males than females; the inhabitants of temperate climates, than those of higher or lower latitudes.

Symptoms of Stone in the Bladder.—These consist in a troublesome itching, sometimes amounting to pain, at the extremity of the penis, with a frequent desire to make water and evacuate the bowels: the urine is voided with great pain, particularly the last drops, and while flowing in a full stream is liable to be suddenly arrested, from the stone falling against the vesical orifice of the urethra. When much irritation is present, the urine on cooling becomes cloudy, and deposits a large quantity of ropy mucus, not unfrequently mixed with blood, especially after any rough exercise. All these symptoms vary in degree, according to the size of the stone and the smoothness or roughness of its surface, its fixed or loose position in the bladder, the quality of the urine, and the condition of the bladder. Instances are recorded of persons living with stone in the bladder for years, yet suffering little or no inconvenience from it, but these cases must be considered exceptions; in general the health sooner or later gives way, and, without recourse to one of the operations we are about to speak of, the patient lingers out a miserable existence till death terminates his sufferings. Nearly all the symptoms we have just described as belonging to stone in the bladder may however be simulated by other diseases of the bladder or neighbouring parts; a positive diagnosis therefore can never be made before *sounding* the patient. This consists in introducing into the bladder, through the urethra, a metallic instrument called a sound, by means of which the stone can be plainly felt, and an audible noise perceived on striking it: till this be rendered evident no surgeon would be justified in undertaking the operation. It sometimes happens that stones are forced, by the violent contractions of the bladder during fits of the complaint, between the fasciculi of the muscular coat of this viscus, so as to become what is termed encysted; or they may become adherent to some portion of the parietes of the bladder: under these circumstances the surgeon would hesitate before he undertook the operation.

Modes of performing Lithotomy.—To describe at length the various modes of operating for the stone, and the modifications which each method has undergone, would occupy too much space in a publication not strictly surgical; we shall therefore merely glance cursorily at those formerly in use, while we direct our attention more particularly to the method which is employed at the present day.

Of the Apparatus Minor, Cutting on the Gripe, or Celsus's Method.—This is the most antient kind of lithotomy, and has probably been practised from time immemorial; but Celsus having first described it, it has been called *Lithotomia Celsiana;* and from the stone, previously fixed by the pressure of the fingers in the anus, being cut directly upon, *cutting on the gripe,* a knife and a hook being the only instruments used. The appellation of the *lesser apparatus* was given to it by Marianus, in order to distinguish it from a method which he described, called the *apparatus major,* from the many instruments employed. The objections to cutting on the gripe are,—1st. It is only applicable to children under fourteen years of age. 2nd. It is uncertain what parts are divided; this depending on the degree of force employed in making the stone project in the perineum. 3rd. The injury liable to be inflicted on parts whose integrity is essential to the success of the operation.

Apparatus Major, or Marian Method, was founded on erroneous principles, and in ignorance of the nature of the parts to be operated on. It was supposed that wounds of membranous parts would not heal, while their dilatation might be undertaken with impunity. In conformity with these notions, the precept of Celsus, 'Ut plaga paulo major quam calculus sit,' was neglected, and the object endeavoured to be attained was, to do as little as possible with the knife, and as much as possible with instruments called dilators; but the parts thus subjected to attempts at dilatation are inelastic, and consequently were lacerated. The severe injury thus produced rendered this one of the most fatal operations in surgery; but notwithstanding this, it was practised for near 200 years, till Frère Jacques, in 1697, taught at Paris the method at present in use.

High Operation—so named from the incision into the bladder being made above the pubes, was first practised in Paris in 1475, by Colot, as an experiment on a criminal, by permission of Louis XI.; but the earliest published account of this mode of operating was in 1556, by Pierre Franco. This method is most applicable to those cases in which the stone is too large to be extracted from the perineum, or where there is disease of the urethra and prostate gland; but there are several objections to it, and it is now entirely abandoned.

Operation through the Rectum.—This method was first suggested in a work published in the sixteenth century; but the proposal never received much attention till the year 1816, when it was revived by M. Sanson, of Paris, and carried into operation by him and by Dupuytren; but the unfavourable results which attended the performance of this operation prevented its being generally tried or adopted, and no one of the present day ever thinks of performing it.

Lateral Operation—so called from the prostate gland and neck of the bladder being cut laterally, in order to avoid wounding the rectum, is that adopted at the present day. It was first practised by Pierre Franco, a surgeon at Tourrières, but he never established the method as a permanent improvement in surgery; this was left for Frère Jacques, a priest, who, in 1697, came to Paris in order to make known this method, which he employed with great success at various places. Although it appears that he was not quite so successful as he had led the world to believe, the superiority of his mode of operating was immediately perceived and recognised, and, with slight modifications, was adopted by most of the surgeons of that period. Hitherto the Marian section had been used: the advantages of an operation by which a free opening was made into the bladder, over one in which it was so small as not to admit of the extraction of the stone without laceration of the parts, are too obvious to require comment. Surgeons of the present day differ somewhat as to the extent of the opening to be made into the bladder, and on the choice of instruments to be employed; some make use of a common scalpel, which cuts into the bladder from without inwards; while others prefer the bistoire caché, or gorget, which divides the prostate gland and neck of the bladder from within outwards. Having premised thus far, we will proceed to describe the operation as usually undertaken with the cutting gorget. The patient having been sounded, to ascertain that the stone is actually within the bladder (for instances have occurred of stone becoming encysted a short period before the operation), and the rectum being emptied by means of a clyster, he is placed on his back upon a table, with his buttocks projecting rather beyond its edge; he should be directed to grasp the outside of each foot with the hand of the same side, and the two pair should then be firmly bound together. A *staff,* which is an instrument shaped very much like a catheter, or sound, but somewhat longer, and grooved on its convex side, is passed through the urethra into the bladder, where it must be retained firmly by an assistant; its convexity looking towards the perineum, and the groove slightly inclined to the left side of the patient. The operator now commences his incision below the bulb of the urethra, about an inch and a quarter in front of the anus, and continues it obliquely downwards to the left of the raphé of the perineum for three inches, till it reaches midway between the tuberosity of the ischium and the anus: this should cut through the integuments and superficial fascia. The next incision, made in the same direction, divides the transversus perinei muscle, and exposes the membranous portion of the urethra, which must be opened, and the groove in the staff felt for with the finger; into this groove, which serves as a director for making the concluding section of the operation, is inserted the beak of the *gorget* (a sort of knife terminated by a beak, that fits into the groove of the staff). The operator now rises from his chair, and, taking the staff in his left hand, raises its handle from the abdomen till it forms nearly a right angle with the patient's body; the gorget is now pushed onwards, along the groove, till it enters the bladder. By raising the handle of the staff the gorget is made to enter the bladder in a direction corresponding with its axis, and the danger of wounding the rectum is thereby avoided. As soon as the gorget has been introduced the staff is withdrawn, and a pair of long forceps, expressly adapted for this operation, is passed along the gorget into the bladder, and this latter instrument withdrawn. The stone is now to be seized, and gently extracted; but it sometimes happens that a stone is too large to be removed without using a degree of force that would be perfectly unjustifiable: in this case, if the wound will not admit of further enlargement, nothing remains to be done but crushing it, and thus taking it away piecemeal. A stone should always be examined immediately after it is extracted, because its appearance conveys some information concerning the existence of others; and in every instance the cavity of the bladder should be explored with the finger, to ascertain that there is no other stone present. Encysted calculi seldom require an operation for their removal, but, should this be necessary, the cyst may be opened by a blunt-pointed bistoury, and the stone taken away. When a stone is known to be of ample size, some operators perform what is called the bilateral operation, from both sides of the prostate gland being cut; for this purpose a double-edged knife has been invented, called the *double lithotome;* but Mr. Liston is of opinion that no complicated machine is requisite to make this bilateral division, and that it is quite time enough to do it when the necessity for it has been ascertained.

Lithotomy in Women.—From the shortness, largeness, and very dilatable nature of the female urethra, the surgeon is seldom called upon to perform the operation in women. The formation of calculi is perhaps not less common in women than in men; but from the anatomical circumstances just alluded to, stones of considerable magnitude have been voided spontaneously. This fact has suggested the plan of mechanically dilating the urethra, and thus extracting them without the employment of any cutting instruments; but where the stone is very large, the degree of dilatation necessary for its extraction is liable to produce paralysis of the part, and incontinence of urine ever after. To avoid these evils, an artificial opening should be made into the bladder. The operation is simple. A strait staff, or director, is introduced through the meatus urinarius; the groove is turned obliquely downwards and outwards, in a direction parallel to the ramus of the left os pubis; and the knife is thus conducted into the bladder, and makes the necessary incision through the whole extent of the passage and neck of the bladder.

Treatment after the Operation.—The dangers to be guarded against after an operation of lithotomy are, inflammation of the bladder and peritoneum; infiltration of urine into the cellular texture of the perineum and parts adjacent; and hæmorrhage. To prevent the dangers that would arise from inflammation, the patient should be kept perfectly quiet, and on a low regimen; but supposing it to have set in, the most prompt and energetic measures must be had recourse to; copious venesection, the use of the warm bath and fomentations, with the administration of such medicines as are known to be most efficacious in such cases, afford the only chance of preserving the patient. Infiltration is to be avoided by placing the patient in such a position that the urine can flow readily from the wound, which should be left uncovered, or this end is attained more effectually by introducing an elastic gum catheter into the bladder, and suffering it to remain there for the first two or three days. Hæmorrhage is fortunately a rare occurrence; but should this take place, pressure, made by means of sponge or lint compresses, may be tried; and if this fail, the bleeding vessel must be sought for and tied.

LITHOTRITY (from λίϑος, a stone, and the root τρι, to pierce); *Lithotripsy* (from λίϑος, and τρίϐω, to break), 'the reduction of a calculus in the bladder into small pieces, by means of instruments passed into that organ through the urethra, so that the fragments may be discharged through the latter tube, and no necessity remain for the performance of lithotomy.' This operation, which must be ranked among the most brilliant achievements of modern surgery, was first seriously proposed in 1812, and Gruithuisen, a Bavarian surgeon, constructed an apparatus for performing it. But the originality of the idea was probably derived from antient writers, several of whom speak of the practicability of breaking stones within the bladder, although they make no mention of the mode of performing it. At the commencement of the nineteenth century, Rodriquez, a physician of Malaga, is said to have broken a stone in the bladder by striking it with a catheter; but the first suggestion we meet with of an apparatus constructed expressly for this purpose is by Gruithuisen. It consisted of a wide strait tube, which was introduced through the urethra into the bladder. Through the tube was passed a noose of copper wire (by which the stone was caught hold of and fixed) and a rod terminating in a circle of teeth or a spear-point; a drilling-motion was now given to the latter instrument by means of a bow, and the stone was thus perforated or broken. Since this period, the operation has undergone successive improvements in the hands of Leroy, Civiale, and Heurteloup. The following is the mode of proceeding adopted by this last gentleman. The patient is placed on an operating bed, so constructed as to admit of any inclination being given to it that the operator may think proper. At its foot is an apparatus for affording a fulcrum to the instrument which is to be passed into the bladder; and two slippers, securely fixed at a short distance on each side of the apparatus alluded to, serve for securing the feet of the patient, who is placed in a position nearly resembling that chosen for the operation of lithotomy. The bladder is now moderately distended with warm water injected through a catheter. A pair of strong sliding forceps, the opposite surfaces of which are furnished with teeth, are then introduced; and the calculus having been seized, the lower piece of the forceps is fixed to a vice at the foot of the bed serving as a fulcrum, and the upper piece is struck with a hammer and the calculus broken. Thus, neither the shock arising from the concussion is communicated to the bladder, nor is this organ liable to be injured by the fragments being forcibly projected against its internal surface. The instruments are then withdrawn, and the fragments are afterwards voided with the urine; or if any remain too large to be thus discharged, the operation is repeated from time to time till all is got rid of. It were to be desired that an operation so simple, productive of so little pain, and so entirely free from the dangers attendant on the operation of lithotomy, was more generally applicable than it is found to be, but it is subject to the following disadvantages. The patient does not obtain a cure at once, and in many instances the operation is required to be repeated several times; and as the smallest fragment which remains behind will form the nucleus of a new stone, a recurrence of the disease is more likely to take place after this operation than after lithotomy. It is unfit for calculi formed on extraneous substances which have entered the bladder, for encysted or adherent calculi, for large or very hard calculi, for patients with enlarged prostate gland or diseased bladder, and for children. The accidents liable to arise from the operation are generally less grave than those to which the operation of lithotomy is subject; two of the most serious that have taken place are perforation of the coats of the bladder and the breaking of the instrument within this viscus. But where the stone is small and not too hard, and other favourable circumstances are present, we imagine few could be found who would not give it the preference over the operation of lithotomy.

LITHUA'NIA, a large tract of country which now forms some important provinces of the Russian empire, but which once constituted an independent and powerful state, until it was united to Poland by the accession of its reigning dynasty to the throne of that country. Its history is very remarkable, and presents a most extraordinary instance of a nation which, after having remained for centuries in a state of utter insignificance, assumed, by its conquests and wise policy, in a comparatively short time, a station which rendered it for about a century the most formidable power of the north.

The early history of Lithuania is involved in much obscurity, and the several traditions contained in its chronicles are exceedingly confused. A current tradition that a Roman colony had settled on the shores of the Baltic has been shown to be a mere fable. There are some very ingenious conjectures that the Heruli, who destroyed the Western empire under Odoacer, were inhabitants of Lithuania, and that after their expulsion from Italy they returned to this country, and brought with them those words, resembling the Latin, which abound in the Lithuanian language.

The first mention of Lithuania occurs in the chronicle of Quedlinburg, A.D. 1009. (Naruszewicz, *Hist. of Poland*, vol. iv., p. 145.) From that time the name of Lithuania begins to appear more frequently in Russian chronicles, which speak of the Lithuanians as a poor and savage nation, some tribes of which were compelled by the bordering Russian princes to pay a tribute, consisting of the bark of birch trees for making oil, of ropes made of the bark of lime trees, and of brooms. The rudeness and poverty of the nation must have been very great if their conquerors were satisfied with such sylvan produce. In the twelfth century the Lithuanians began to be more known, particularly by their wars with the German knights.

Towards the year 1200, Albert, bishop of Riga, founded the order of the Knights Sword-bearers (Ensiferi), in order to conquer the pagans who inhabited the shores of the Baltic from the Curische Haff to the Gulf of Finland. The half-savage barbarians were soon subdued by the valour and military skill of those warrior monks, and reduced to a state of the most oppressive bondage. Not long after, about 1220, Conrad, duke of Mazovia, being unable to resist the predatory attacks of the Prussians, a branch of the Lithuanians, called to his assistance the Knights of St. John of Jerusalem, and granted them a large tract of land, with many castles. These knights did the same in Prussia that the Sword-bearers had done elsewhere; and the two orders acquired new strength from their union, which was effected in 1238, and became most formidable enemies to their neighbours, particularly to the unconverted Lithuanians. These priestly soldiers were certainly the bravest, the most skilful, and the best armed militia of that time; and their numbers were continually recruited by German adventurers, who flocked to their standard in order to obtain the remission of their sins and a grant of lands wrested from the native idolaters. Such were the enemies with whom the Lithuanians had to contend, they themselves being ignorant of the science of war, almost destitute of defensive armour, and having for the most part no other weapons than spears, clubs, and arrows. In spite of these disadvantages they not only resisted the German invaders but gained possession of some of those Russian principalities to which they had been obliged to pay tribute. The decline of the powerful Russian principality of Halicz, by the death of Prince Roman, who was defeated and killed by the Poles in the battle of Zarichost, 1206, delivered the Lithuanians from a formidable enemy, and their predatory incursions began to be more dangerous to the Polish and Russian principalities: some of the latter fell into the hands of Lithuanian chieftains, who generally sought to consolidate their acquisitions by embracing the creed (that of the Eastern Church) of their new subjects, although the bulk of the Lithuanian nation remained faithful to their idols.

Ryngold was the first Lithuanian ruler who, after having united under his dominion all the principalities of that nation, assumed the title of Grand-Duke of Lithuania about 1235. His son Mindog, having received from the Pope the royal diadem, embraced Christianity, and was crowned at Novogrodok in 1252 (formerly the capital, now an insignicant town), by the archbishop of Riga and another Roman Catholic prelate; but not having obtained the advantages which he expected from his conversion, he soon relapsed into paganism. At the end of the thirteenth century Witenes established a new dynasty on the throne of that country; but Lithuania's most brilliant æra began after the accession of the grand-duke Ghedymin in 1315. He made most extensive conquests in the south-western principalities of Russia, and consolidated his power by insuring the most perfect protection to the religion, language, customs, and property of the inhabitants of the conquered lands. But the most extraordinary circumstance of that conquest is, that those newly acquired provinces were intrusted only to the administration of such princes of the Lithuanian dynasty as had embraced the religion of the conquered population, whilst the sovereign still remained an idolater. This wise policy, so contrary to the spirit of intolerance displayed by other conquerors, strongly attached the Russian Christians, who were five times as numerous as the real Lithuanian population, to their new masters, under whose sway they found that repose and security of which they had been for a long time deprived by the internal feuds of their petty princes, and the incessant annoyance from the Mongols, who, possessing the north-eastern principalities of Russia, constantly attempted to extend their rule over those parts which became now a portion of the Lithuanian empire.

Two nations, of a different origin and creed, thus became soon blended together, and the Russian Christians were always the most loyal subjects of the pagan grand-dukes of Lithuania. The Russian became the official language of Lithuania, and continued so till the middle of the seventeenth century, when it was superseded by the Polish language.[*]

The government of Lithuania was in some degree feudal: each province was given in fief, generally to a prince of the reigning family. There was not however anything like the regular feudal organization of western Europe. After its union with Poland, Lithuania was governed by the same forms as that country.

Ghedymin was killed in 1328, at the siege of the fortress of the German knights. He divided his empire among his several sons, but after some contention, one of them, called Olgherd, assumed the sovereign power. He proved a worthy successor to his glorious father: he defeated the Tartars, and compelled those of Crimea to become his vassals, having extended the limits of Lithuania to the banks of the Don and to the shores of the Black Sea. The republics of Novogorod and Pskow acknowledged his supremacy, and he presented himself in triumph before the gates of Moscow in the years 1368, 1370, and 1373. He died in 1381, in the Christian community of the Greek church, which he embraced on his death-bed, at the solicitations of his wife, who was a Russian princess of Twer. It is even supposed that he had secretly been a Christian during his lifetime, and had early become a convert to its doctrines.

Olgherd's son and successor, Yaguellon, married, in 1385, Hedvige of Anjou, queen of Poland, and, having been baptized, ascended the throne of that country. From that time Lithuania was united with Poland.

Yaguellon, having become a Christian, strenuously exerted himself to convert his pagan subjects. The attachment of these idolaters to their religion seems to have been at that time very weak, and Yaguellon had no great difficulty in accomplishing his task. It is asserted by the chronicles that the promise of a new white woollen coat was sufficient to induce the Lithuanian pagans to desert their idols and to approach the baptismal font.

Yaguellon himself translated for the use of his subjects the Creed and the Lord's Prayer into the Lithuanian language. It was natural for the new converts to retain for a long time many heathen rites, and even in our days the common people preserve many customs evidently derived from their idolatrous forefathers. Although by the accession of Yaguellon to the throne of Poland the two countries became united, it often happened that the kings of Poland of the Yaguellonian family, who were hereditary sovereigns in Lithuania, but elective in Poland, after their accession to the crown of the latter country, gave up the government of Lithuania to a prince of their family, but still retained the sovereignty. The most celebrated of those princes was Vitold (1430). A kind of union of the two countries was effected at the diet of Lublin in 1569, composed of senators and deputies of both nations. By this transaction the rights of the Polish nobles were extended to those of Lithuania, whose throne became elective like that of Poland. The diets of the two countries were held in common, but the laws, finances, and armies remained separate. This state of things continued till the fall of Poland.

We have already said that Lithuania extended under the reign of Olgherd as far as the banks of the Don and the shores of the Black Sea. It lost a great part of its dominions under the reign of Casimir III., king of Poland and grand-duke of Lithuania, and on several subsequent occasions. But these events belong to the history of Poland, of which Lithuania then formed an integral part. At the time of the first dismemberment of Poland in 1772, Lithuania was divided into the following palatinates or counties: Vilna, Troki, Novogrodek, Brest, Vitepsk, Polock, Mstislaf, and the duchy of Samogitia.

The territory which constituted the government duchy of Lithuania at the above-mentioned time now forms the Russian governments of 1, Vilna; 2, Grodno; 3, Bialystock; 4, Minsk; 5, Mohilew; and 6, Vitepsk; and, 7, the palatinate of Augustov, in the kingdom of Poland, constituted by the treaty of Vienna, 1815. The extent and population of this province are as follows:—

Vilna	22,970	Eng. sq. miles	1,357,400 pop.
Grodno	6,930	,,	868,100
Bialystock	3,360	,,	224,600
Vitepsk	14,190	,,	934,900
Mohilew	19,500	,,	985,400
Minsk	38,930	,,	1,163,100
Augustov	19,000	,,	335,000[*]

Lithuania is generally a flat and low country, although there are some hills in the environs of Vilna. The north-western part, comprehending the duchy of Samogitia, is very fertile, and celebrated particularly on account of its flax. The banks of the Niemen are also generally fertile, and in many parts very picturesque. But the greater part of this country is covered with sand, marshes, and fens. Ferruginous ochre is found in all the peat-mosses, but the quantity of iron is very limited, and many iron-works which formerly existed are now abandoned in consequence of the cheaper rate at which iron can be got from the mines in the north of Russia and Siberia. Blocks of granite and pudding-stone are scattered over many districts. The large forests abound in fine timber, and contain a great quantity of wild animals, such as elks, wild hogs, bears, wolves, foxes, &c. An animal peculiar to Lithuania is the urochs, or bison, which was formerly found in many forests of Poland and Germany, but is now confined to a single spot in Lithuania, called the forest of Biala Vieja. [BISON.] The climate is extremely cold in winter, and very hot in summer. There are scarcely any manufactures in the country, and its exports consist chiefly of flax, hemp, corn, timber, honey, and wax.

The principal rivers which water Lithuania are the Niemen (in German, Memel), the Dnieper, Berezina, Villia, &c. The chief towns are Vilna, its antient capital, Grodno, Minsk, Mohilew, Vitepsk, &c.

It has been mentioned that the Lithuanians remained idolaters till the end of the fourteenth century. Their chief deity was Perkunas, or the god of thunder, besides some other divinities presiding over seasons, elements, and particular occupations, as was the case in almost all the idolatrous creeds of antient Europe. They possessed also sacred groves and fountains, and worshipped the fire and consecrated snakes. Some learned disquisitions have been written on the probable origin of the antient Lithuanian worship; among others, Lasicius, or Lasitski, 'De Diis Samogitorum,' in the collection of Elzevir, 'De Republicâ Polona.'

The population of Lithuania is composed of Lithuanians, Lithuano-Russians, Poles, Jews, and Tartars. The last form a population of about 100,000 individuals, and are descendants of a Tartar colony settled in Lithuania by the grand-duke Vitold towards the end of the fourteenth century. They all profess the Mohammedan religion, but they re not distinguished in externals from the other inhabitants f the country. Those who are descended from the Tartar aurzas, or nobles, were admitted into the ranks of the Polish nobility, and possessed all the privileges of that order, and they continue to possess them under the Russian government. They enjoy a high reputation for honesty, and are enerally employed in various offices of trust.

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[*] This Russian idiom is quite different from the Muscovite, or modern Russian. It is a dialect called generally that of White Russia, and it is now spoken by the population of the present governments of Vitepsk, Mohilew, and Smolensk. It has no literature except the statute or code of laws of Lithuania, published in the sixteenth century, and the official records of that country till the middle of the seventeenth century.

[*] We have followed the data furnished by Hassell, 1823, and adopted by Malte Brun in his 'General Geography,' and Schnitzler in his 'Statistics of Russia.'

We have already said that the origin of the Lithuanian ation is involved in obscurity, and that all the conjectures n this subject lead to no satisfactory conclusion. We have lso alluded to the tradition about a Roman colony in Lithuania. Adelung and Vater define the Lithuanians to be Germano-Slavic nation, and say that two-thirds of their nguage are Slavonian. Balbi, in his 'Ethnographical tlas,' places the Lithuanian language among the Slavonian, and states, on the authority of Mr. Watson, that it is omposed of four-sixths of Slavonian, of which two-sixths e derived from the Polish and two-sixths from the ussian languages, whilst the remaining two-sixths may be aced to the Finnish, Gothic, and German. The opinion owever appears to us by no means a correct one. There n be no doubt that a great number of Slavonic words ecame mixed with the Lithuanian language, from the circumstance of the Russian and afterwards the Polish being e official languages of that country: it is also certain that e rule of the German knights introduced many German ords into the Lithuanian language, but their number is by means so large as to warrant the conclusion above mentioned. The recent researches of some distinguished German ilologists, and particularly those of Bopp and Bohlen, have oved that the Lithuanian language is closely allied to the nscrit, and that all the words, except those of modern troduction which are derived from the Latin, Germanic, d Slavonian languages, are so related to Sanscrit roots, common with those above-mentioned languages, as to ove only that the Lithuanian language has a common igin with them, but not that it is derived from them. rofessor Bohlen, of Königsberg, an eminent Sanscrit holar, who is intimately acquainted with the Lithuanian nguage, thinks that it bears a stronger resemblance to the nscrit than to any other known language. The Lithuanian language may be divided into two principal dialects, e Lithuanian Proper, and the Lettonian, or Livonian, both which may be subdivided into smaller ones. The Lithuanian Proper contains the following dialects:—1st, the old russian, which had been spoken in Prussia previously to e arrival of the Knights of St. John of Jerusalem, who ied by all means to extirpate it. Notwithstanding this ıfavourable circumstance, it was still in general use at the ne of the Reformation; but in spite of the support it derived from the Protestant authorities, it dwindled away, that according to Hartknoch, who wrote towards the end the seventeenth century, there were at that time only few old people who understood it, and it is now entirely tinct as a living language. It differs from other Lithuanian dialects in having a greater admixture of German an Slavonian words, which was owing to the influence of e German knights, who took possession of the country, d whose language finally superseded that of the native opulation.

Simon Gruner, a Dominican monk, translated in 1521 e Lord's Prayer into that language, and collected a small ocabulary of eighty-nine words. Albert, duke of Prussia, zealous propagator of the Reformation, ordered a catechism to be composed in that language, which was published t Königsberg, 1545. The authors of this catechism, wishing make it intelligible to all the inhabitants of Prussia, used its composition promiscuously all the local dialects into hich this language is subdivided: the result of such an bsurd plan was, that it became unintelligible to all. It as therefore remodelled, and the dialect of Samland, as eing the most widely spread, was adopted. This catechism, well as the Enchiridion, or church service (Königsberg, 561), are the only extant monuments of that old language.

2. The Prusso-Lithuanian dialect, which is now spoken bout Insterburg and Memel, is the nearest to the old Prussian, but it has received a great admixture of Polish ords. A Bible, translated into that language by Quandt, as published at Königsberg, 1755, and many religious orks in that same dialect are mentioned in its preface.

The Polish-Lithuanian, or Samogitian language, which is spoken in the north-western part of Lithuania, and particularly in the province of Samogitia, differs from the Prussian dialect in being more free from the admixture of German words, and it is certainly the purest of all the dialects, as the population by which it is spoken resisted the German invaders. The Russian language, which, as we have seen, became the official language of the country, from the fourteenth century, and the subsequent influence of the Polish, have introduced many words derived from both these languages. There is in that dialect a Protestant Bible translated by Chilinski, published at London in 1660, and many other works of a religious character.

The second principal dialect of the Lithuanian is the Lettonian, or the Livonian, which is sometimes called the Curonian. It is spoken in the greatest part of Livonia, in Courland, and a part of the government of Vitepsk, which was formerly called Polish Livonia. It differs from the other Lithuanian dialects in having an admixture of Finnish words, which is peculiar to this dialect. It is subdivided into several minor dialects, of which that which is spoken about Mittau and Riga is considered the best, and it has been used for the translation of the Bible, and for the composition of several religious works. There is at the University of Dorpat a chair of this language.

For a circumstantial account of the works published about the Lithuanian language, or composed in it, see *Mithridates*, by John Adelung, continued by Severin Vater, vol. ii., p. 696, &c., Berlin, 1809: as to its connexion with the Sanscrit, see Bopp's *Comparative Grammar*, and the article LANGUAGE.

LITI'OPA, a genus of pectinibranchiate mollusks, established by M. Rang, with the following characters:—

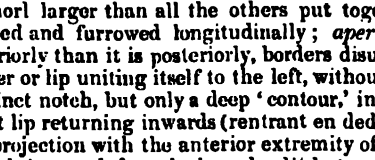
Animal transparent, spiral, furnished with a rather short and narrow *foot*, and a head provided with two elongated conical tentacles, with the eyes at their external base.

Shell not thick, horny, with a slight epidermis, slightly transparent; conoïd; the *whorls* of the spire rather rounded, the last whorl larger than all the others put together, the *apex* pointed and furrowed longitudinally; *aperture* oval, wider anteriorly than it is posteriorly, borders disunited, the right border or lip uniting itself to the left, without forming a very distinct notch, but only a deep 'contour,' in the place of one; left lip returning inwards (rentrant en dedans) so as to form a projection with the anterior extremity of the columella, which is rounded, arched, and a little truncated anteriorly. No *operculum*.

M. Rang places this form between *Janthina* and *Phasianella;* and observes that the habits of this pelagic mollusk are very curious. He states that he had many years ago observed the shell, but time had not permitted him to study the animal. M. Bellanger, captain in the French navy, was the first who recognised it, but that gentleman unfortunately had not studied its external organization; he observed however the singular fact that this animal, which lives upon floating plants, quits them sometimes, but holds itself fixed by a thread.* M. Rang dissected some specimens preserved in spirit of wine given to him by that officer, and detected some small glairy masses which appeared to M. Rang to be attached to the foot, and which were easily drawn out to considerable length. M. Rang looked in vain for an operculum, the absence of which establishes a great difference between this genus and *Phasianella*, and has described two species, different as regards the shell, but with apparently similar animals.

Geographical Distribution.—The ocean.

M. Rang observes that the genus *Litiopa*, like some others, proves that it is not possible to establish divisions founded on the presence or absence of an operculum.



Shell of Litiopa, magnified.

LITMUS, or LACMUS, a fine blue but fugitive colour prepared from the *Lecanora tartarea*, a lichen which grows in the Canary and Cape Verd Islands. In order to extract the colouring matter the lichen is cleaned and reduced to powder; this is then mixed with urine and lime, and in a few days the blue colour is developed. The litmus is imported in small cubical cakes of dusky-blue colour, which are light and easily reducible to powder. The colouring matter, which is supposed to be *erythrin*, existing also in archil, is soluble both in water and spirit of wine, and is of a beautiful tint.

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* See LIMNEANS, vol. xiii., p. 500.

Litmus is used as a chemical test for detecting the presence of acids, by which it is turned red, and the blue is restored by alkalis, so that when slightly reddened it may also be employed to detect alkalis. It is employed either as a tincture, or more commonly paper stained blue with it is used. The tincture is sometimes, but improperly, called tincture of turnsole, a name which was given to the colour in order to keep its true source a secret.

The blue colour of the litmus is evidently owing to the presence of an alkali, for when moistened litmus and turmeric paper are put into contact, the turmeric becomes brown, indicating the action of an alkali. To a certain extent therefore the alkali reduces the value and accuracy as a test of acids; it was nevertheless found by Mr. Watt that it detected the presence of sulphuric acid diluted with 100,000 times its weight of water.

By exposure to the sun's rays tincture of litmus becomes red even in close vessels; and there exists between its colouring matter and that of indigo a certain degree of analogy; both for example are capable of being deprived of oxygen, and when thus deoxidized lose their blue colour, which is restored by exposure to the air or other means of reoxidizement. The protosalts of iron also, which are well known to deoxidize indigo, produce the same effect upon litmus.

LITRE, the French standard measure of capacity in the metrical system. It is a cubic decimetre, or a cube whose sides are each 3·9371 English inches. It contains 61·0280 English cubic inches, for four litres and a half make, roughly speaking, an imperial GALLON. The litre is therefore a little less than our quart: more precisely, it is ·22009687 of a gallon.

LITTLETON, THOMAS, was the eldest son of Thomas Westcote, of the county of Devon, Esq., by Elizabeth, the daughter and sole heiress of Thomas Littleton, or Luttleton, Luttelton, or Lyttelton (the last being the mode in which he himself appears to have written it: see the extract from his will given below), of Frankley in Worcestershire, whose surname and arms he took. He was educated at one of the universities, and thence removed to the Inner Temple, where in due time he became one of the readers of that Society: Sir Edward Coke mentions his reading on the statute *Westm. 2, De donis conditionalibus*. He was appointed by Henry VI. steward or judge of the court of the palace or marshalsea of the king's household. On the 13th May, 1455, in the 33 Henry VI., he was made king's serjeant, and in that capacity rode the northern circuit as judge of assize. In 1454 he had a general pardon under the great seal,* and two years after was in commission with Humphrey, duke of Buckingham, and William Birmingham, Esq., to raise forces in the county of Warwick. (Collins, *Peerage*, who gives as his reference, ' Pat. 36, Hen. 6, p. 1, m. 7.) In 1462 (2 Edward IV.) he received a general pardon from the crown, and was continued in his post as king's serjeant, and also as justice of assize for the same circuit. On the 26th April, 1466 (6 Edward IV.), Littleton was appointed one of the judges of the Court of Common Pleas, and rode the Northamptonshire circuit. About the same time he obtained a writ, directed to the commissioners of the customs for the ports of London, Bristol, and Kingston-upon-Hull, for the annual payment of 110 marks, to support his dignity, with 106*s.* 11½*d.* to furnish him with a furred robe, and 6*s.* 6*d.* more for another robe, called *linura*. In the fifteenth year of the same he was created a knight of the order of the Bath. Sir Thomas Littleton married Joan, widow of Sir Philip Chetwin, of Ingestre, in the county of Stafford, one of the daughters and co-heiresses of William Burley, of Broomscroft Castle, in the county of Salop, Esq., with whom he had large possessions. By her he had three sons and two daughters. 1. William, ancestor of the Lords Lyttelton, barons of Frankley, in the county of Worcester. 2. Richard, to whom the 'Tenures' are addressed, an eminent lawyer in the reigns of Henry VII. and Henry VIII. 3. Thomas, from whom were descended the Lord-Keeper Lyttelton, baron of Mounslow, in the reign of Charles I., and Sir Thomas Lyttelton, Bart., Speaker of the House of Commons in the reign of William III. His two daughters, named Ellen and Alice, both died unmarried. (Collins's *Peerage*, vol. vii., p. 424.)

Littleton died at Frankley on the 23rd August, 1481, aged about sixty, and was buried in Worcester cathedral, where his tomb bore the following inscription:—'Hic jacet corpus Thome Littelton de Frankley, Militis de Balneo, et unus Justiciarorum de Communi Banco, qui obiit 23 Augusti, Ann. Dom. MCCCCLXXXI.'

In Collins's 'Peerage' there is a copy of Sir Thomas Littleton's will, 'faithfully copied from the original remaining in the Prerogative Office.' It contains some curious particulars; but we can only make room for the following extract from its commencement:—

'In the name of God, Amen. I, Thomas Lyttelton, Knight, oon of King's justice of the common place, make my testament, and notifie my wille, in the manner and forme that followeth. First, I bequeth my soul to Almighty God, Fader, Sonne, and Hollye Ghost, three Persons and oon God, and our Lorde, maker of heven and erth, and of all the worlde; and to our most blessed Lady and Virgin, Saynt Mary, moder of our Lord and Jesu Christ, the only begotten Sonne of our saide Lorde God, the Fader of heven, and to Saint Christopher, the which our saide Lorde did truste to bere on his shouldres, and to all the saints of heven; and my body to be berried in the tombe I lete make for me on the south side of the body of the cathedrall-church of the monastere of our said blessed lady of Worcester, under an image of St. Christopher, in caas if I die in Worcestershire. Also, I wulle, and specially desire, that immediately after my decesse, myn executors finde three gode preests for to singe jjj trentals for my soule, so that everich preest, by himself, sing oon trental, and that everich such preest have right sufficiently for his labor; also, that myn executors finde another gode preest for to singe for my soule fyve masses,' &c. He then makes a provision for his two younger sons, willing that the 'feoffées to myn use' of and in certain manors and lordships should 'make some estates' unto his sons Richard and Thomas Lyttelton.

He appointed his three sons and 'Sir Xtopher Goldsmyth, parson of Bromsgrove, Sir Robert Cank, parson of Enfield, and Robert Oxclyve,' to be his executors. The will is dated at Frankley, 22nd August, 1481, being, as appears from the date of his death on his monument already quoted, the day preceding that of his death.

Sir Edward Coke has given it as his opinion that Littleton compiled his book of 'Tenures' when he was judge, after the reign of King Edward IV., but that it was not printed during his life; that the first impression was at Rouen in France, by William de Taillier, *ad instantiam Richardi Pinson*, the printer of Henry VIII., and that it was first printed about the twenty-fourth year of the reign of Henry VIII. In a note to the eleventh edition of Sir Edward Coke's 'Commentary,' it is remarked that this opinion is erroneous, because it appeared by two copies in the bookseller's custody that the 'Tenures' were printed twice in London in the year 1528, once by Richard Pinson, and again by Robert Redmayne, and that was the nineteenth year of the reign of Henry VIII. It is observed that, to determine with certainty when the Rohan or Rouen edition was published, is almost impossible; but that from the old editions above mentioned it may be collected, not only that the Rohan impression is older than the year 1528, but also, by what occurs in the beginning and end of them, that there had been other impressions of the book in question. However, it appears impossible, at this distance of time, to settle with accuracy when the first edition of Littleton's work was printed.

Littleton's work on English tenures is written in Norman French, divided into three books, and addressed to his son, for whose use it was probably intended. He says himself in the Tabula, in a note following the list of chapters in the first two books—'And these two little books I have made to thee for the better understanding of certain chapters of the "Antient Book of Tenures."' And after the Table of Contents of book iii. he thus concludes:—

'EPILOGUS.

'And know, my son, that I would not have thee believe that all which I have said in these books is law, for I will not presume to take this upon me. But of those things that are not law inquire and learn of my wise masters learned in the law. Notwithstanding, albeit that certain things which are moved and specified in the said books are not altogether law, yet such things shall make thee more apt and able to understand and apprehend the arguments and the reasons of the law, &c. For by the arguments and reasons in the law a man more sooner shall come to the certainty and knowledge of the law.

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* Collins's 'Peerage,' vol. vii., p. 423, who cites as his authority for this, 'Autographus penes Honoratissimum Dom. Dom. Geo. Lyttelton, Baronem de Frankley.'

'*Lex plus laudatur quando ratione probatur.*'

The circumstance above referred to of this treatise having been originally but a sort of introductory lesson 'for the better understanding of certain chapters of the "Antient Book of Tenures"' may in part account for what has been often remarked respecting its defect in the accurate division and logical arrangement of the subject matter. The style however in which it is written is remarkably good. It combines the qualities of clearness, plainness, and brevity, in a degree that is not only extraordinary for the rude age in which its author wrote, but renders him superior, as to purity of style, to any writer on English law who has succeeded him. It is equally free from the barbarous pedantry and quaintness of Coke, and from the occasionally somewhat rhetorical manner of Blackstone.

Littleton very seldom quotes any authority for what he advances: indeed, it was not the practice of the lawyers of his age to cite many authorities, even in arguments and opinions delivered in court. Littleton is a fair, or rather a favourable specimen of the mode in which the English lawyers, often with great acuteness and consistency, followed out all the consequences that might be logically deduced from certain principles or maxims, some of which maxims or premises being irrational and absurd, necessarily led to irrational and absurd conclusions. What with the alterations in and additions to the law since Littleton wrote, there is much of Littleton's book that is not now law; but from the absolute necessity of a knowledge of what was the state of the law with respect to property in land, in order to understand thoroughly what it now is, Littleton is still an indispensable book to the student of English law. But we are inclined to be of the following opinion given in Roger North's 'Life of the Lord-Keeper Guilford:—'Coke's comment upon Littleton ought not to be read by students, to whom it is at least unprofitable; for it is but a common-place (book), and much more obscure than the bare text without it. And, to say truth, that text needs it not; for it is so plain of itself, that a comment, properly so called, doth but obscure it.' (vol. i., p. 21.) Coke's 'Commentary on Littleton' was no other than a sort of common-place book kept by Coke as a manual, in which he jotted down all his law and references to law as they occurred.

To put this Commentary, or rather common-place book, into a student's hands to read as an institutional or elementary book is evidently futile; and the doing so is probably the cause why so many students of English law break down at the very threshold of their career. The effect is, as North, or rather the Lord-Keeper Guilford, observed, 'like reading over a dictionary, which never teacheth a language:' and therefore with him we may conclude that 'certainly it is an error for a student to peruse such.' (North's *Life of Lord-Keeper Guilford*, vol. i., p. 21.) It is much better for the student who wishes to lay well the foundations of his professional knowledge to read Littleton without the comment (which of course he will find useful afterwards, when he wishes to examine any particular point very minutely); but then he must read slowly and carefully, and a little at a time; in short, very much as he would read Euclid, if he wishes to master it.

(The authorities used in this article are chiefly Coke's Preface to his *Commentary on Littleton*; the article 'Littleton, Thomas,' in the *Biographia Britannica*; Butler's Preface to the thirteenth edition of Sir Edward Coke's *Commentary*; and Collins's *Peerage*, vol. vii., article 'Lord Lyttelton.')

LITTORI'NA. [TURBINIDÆ.]

LITUITES, a group of fossil cephalopoda, confined to the strata of the Silurian and older systems. The shell is partly straight and partly convoluted, nearly as in spirula, *Lam.*

LITURGY (from the Greek *λειτουργία*, which originally signified at Athens 'certain public functions or duties to which the citizens were personally liable') is a form of public devotion, and more particularly the Office of Common Prayer used in our own or any other church. In the Greek or Constantinopolitan church three Liturgies are in use, those of Basil, Chrysostom, and the Liturgy of the Præsanctified. In the Romish church the Liturgy is divided into several books or offices, as the breviary, the ceremoniale, or office peculiar to the pope; the missal, or office of the mass; the pontificale, directing the functions of the bishops, and the rituale, or pastorale, for the guidance of the simple priests. The Spanish is better known by the name of the Mozarabic Liturgy. The Ambrosian Liturgy is that more particularly in use in the church of Milan. In France the church of St. Martin at Tours had a breviary of its own, which was neither the Roman nor that of Tours; and the same difference obtained at St. Quintin and in other Gallican churches.

At the Reformation all the Protestant churches on the Continent, without a single exception, introduced Liturgies for the more uniform celebration of divine service.

Previous to the Reformation of the Church of England the service was performed in Latin, and different Liturgies were used with us, also, in different parts of the kingdom. The cathedrals of York, Lincoln, Hereford, and Bangor, and even Aberdeen in Scotland, had their respective uses; but no cathedral had such a variety of service books for its use as Sarum. 'Use' was another name for the Ordinale, or complete service of the church of Salisbury, instituted by bishop Osmund in 1077. It was also named the Consuetudinary; and in Knighton's and Higden's time it obtained almost all over England, Wales, and Ireland. The whole province of Canterbury adopted it, and in right of it the bishop of Salisbury was precentor in the college of bishops whenever the archbishop of Canterbury performed divine service. (Lyndwood, *Provinc. de feriis c. ult.*)

The publication of king Henry the Eighth's 'Primer' in 1535, in the vernacular tongue, was one of the first steps in the reformation of doctrine and worship in the Church of England. It was followed in 1537 by 'The Godly and Pious Institution of a Christian Man,' containing a declaration of the Lord's Prayer, the Ave Maria, the Creed, the Ten Commandments, the Seven Sacraments, &c., republished with corrections and alterations in 1540 and 1543. In 1545 a second 'Primer' came out; and in 1547, 1st Edward VI., archbishop Cranmer, bishop Ridley, with eleven other bishops and eminent divines, were commissioned by the king in council to compile a Liturgy in the English language free from the erroneous doctrines by which the Latin Liturgies of the church, while unreformed, had been distinguished. This was confirmed by parliament in 1548, and published in 1549. In 1551 it was slightly revised, and again confirmed in parliament; but both this and the former act of 1548 were repealed on the 1st of Mary, as not agreeable to the principles of the Romish Church, which she was about to restore. Upon the accession of Elizabeth the act of repeal was reversed; several learned divines, headed by archbishop Parker, were appointed to make another review of King Edward's Liturgies, when the restoration of the second book of King Edward the Sixth was determined upon, and finally confirmed by parliament. The act received the royal assent April 29th, 1559. In the 1st of James I., after the conference at Hampton Court between that prince with archbishop Whitgift and other bishops and divines on one side, and Dr. Reynolds, with some other puritans, on the other, a few slight alterations were introduced, the chief of which consisted in adding some forms of Thanksgiving at the end of the Litany, and an addition to the Catechism concerning the sacraments: and in the rubric in the beginning of the office for private baptism the words 'lawful minister' were inserted to prevent midwives or laymen from presuming to baptize. In this state it continued till the time of Charles II., who, in 1661, issued a commission to empower twelve bishops and as many Presbyterian divines to consider of the objections raised against the Liturgy, and to make such reasonable and necessary alterations as they should jointly agree upon; nine assistants on each side being added to supply the place of any of the twelve principals who should happen to be absent. On the episcopal side were Dr. Fruen, archbishop of York, Dr. Sheldon, bishop of London, Dr. Cosin, bishop of Durham, Dr. Warner, bishop of Chichester, Dr. Henchman, bishop of Salisbury, Dr. Morley, bishop of Worcester, Dr. Sanderson, bishop of Lincoln, Dr. Laney, bishop of Peterborough, Dr. Walton, bishop of Chester, Dr. Stern, bishop of Carlisle, and Dr. Gauden, bishop of Exeter. O-

Presbyterian side were Dr. Reynolds, bishop of Norwich, Dr. Tuckney, Dr. Conant, Dr. Spurstow, Dr. Wallis, Dr. Manton, Mr. Calamy, Mr. Baxter, Mr. Jackson, Mr. Case, Mr. Clark, Mr. Newcomen. The coadjutors on the Episcopal side were Dr. Earles, dean of Westminster, Dr. Heylin, Dr. Hackett, Dr. Barwick, Dr. Gunning, Dr. Pearson, Dr. Pierce, Dr. Sparrow, and Mr. Thorndike. Those on the Presbyterian side, Dr. Horton, Dr. Jacomb, Mr. Bates, Mr. Rawlinson, Mr. Cooper, Dr. Lightfoot, Dr. Colins, Dr. Woodbridge, Mr. Drake. These commissioners held several meetings at the Savoy, but to little purpose. The king's commission gave them no further power than to 'compare the Common-Prayer Book with the most antient Liturgies that had been used in the church in the most primitive and purest times;' and required them 'to avoid as much as possible all unnecessary alterations of the forms and Liturgy wherewith the people were altogether acquainted, and had so long received in the Church of England.' The Presbyterians however would not allow that the Liturgy was capable of amendment, and Baxter had prepared and offered one of his own to be substituted in its room. The Conference at length broke up without anything being done, except that some particular alterations were proposed by the Episcopal divines, which in the May following were considered and agreed to by the whole clergy in convocation. The principal of them were, that several lessons in the Calendar were changed for others more proper for the days; the prayers for particular occasions were disjoined from the Liturgy, and the two prayers to be used in the Ember-week, the prayer for the parliament, that for all conditions of men, and the general Thanksgiving were added; several of the Collects were altered; the Epistles and Gospels were taken out of the last translation of the Bible, being read before according to the old translation; the office for baptism of those of riper years, and the Forms of Prayer to be used at Sea, were added. In a word, the whole Liturgy was then brought to that state in which it now stands; and was unanimously subscribed by both houses of convocation of both provinces on Friday, 20th of December, 1661; and being brought to the House of Lords the March following, both Houses passed an act for its establishment; and the earl of Clarendon, then lord chancellor, was ordered to return the thanks of the lords to the bishops and clergy of both provinces for the great care and industry shown in the review of it.

(Wheatly's *Illustr. of the Book of Common Prayer*, 8vo., Oxford, 1794, p. 20-28; Shepherd's *Critical and Practical Elucidation of the Morn. and Even. Prayer of the Ch. of Engl.*, 8vo., Lond., 1798, Introd., p. xxxv.-lxxviii.; Gough's *Brit. Top.*, ii. 319-361, &c.)

Among what are called the Additional Manuscripts in the British Museum is 'An Apparatus of Materials,' in forty-five volumes, being a collection of notes and observations on the Liturgy, and various other subjects connected with the offices of the church, by a clergyman of the Church of England, who directed them to be deposited in that institution, but that his name should remain unknown. These volumes were deposited in the British Museum in 1791.

LI'TUUS, a name given to a spiral thus described:—Let a variable circular sector always have its centre at one fixed point, and one of its terminal radii in a given direction. Let the area of the sector always remain the same; then the extremity of the other terminal radius describes the lituus. The polar equation of this spiral is $r^2 \theta = a$.

LI'TUUS, a crooked staff resembling a crozier, used by the augurs among the antient Romans in making their observations on the heavens, hence called the *Augural lituus*. Dr. E. D. Clarke asserts that there was an older lituus, called the *Regal* or *Quirinal lituus*, which the antient kings of Italy held as a sceptre in their hands long before the time of Romulus or the institution of the Augurate, particularly mentioned by Donatus and Servius in their Commentaries upon Virgil. The etymology of the name is uncertain.

(Pitisci *Lexicon*, in voce; Clarke's 'Observations on the Lituus of the Antient Romans,' in the *Archæolog.*, vol. xix., p. 386-404.)

LIUTPRANDUS, or **LUITPRANDUS**, was a deacon at Pavia in the year 946, when Berengarius, marquis of Ivrea and regent of the kingdom of Italy, sent him as his ambassador to Constantinople, where he learned the Greek language. After his return he was made bishop of Cremona. Otho I., emperor and king of Italy, sent him in 962 on a mission to Pope John XII.; and in the following year Luitprand accompanied Otho to the council held at Rome, which deposed John and chose Leo VIII. in his place. On that occasion Luitprand spoke to the council in the name of the emperor, who did not understand Latin, as he says in his Chronicle. In 968 Otho sent him as ambassador to Nicephorus Phocas, emperor or usurper of Constantinople, who treated him very scurvily, and kept him as a kind of prisoner. After four months' residence in that capital Luitprand left Constantinople in the month of October to return to Italy. He died not long after at Cremona, but the precise year of his death is not ascertained.

He was a man of considerable learning for his age, and his works are valuable for the historical information which they contain. They consist, 1, of a general history of Europe from the year 862 to the year 964, 'Rerum Gestarum ab Europæ Imperatoribus et Regibus, libri vi.' Luitprand gives among other things an account of the court of Constantinople at the time of his first mission, and of Basilius and his son Leo the philosopher. The work concludes with the council of Rome and the trial and deposition of John XII. 2. 'Legatio Luitprandi Cremonensis Episcopi ad Nicephorum Phocam.' This is a narrative of his second embassy to Constantinople, in which he describes Phocas in no very flattering colours. The work is very curious. Another work has been attributed to Luitprand, namely, 'De Pontificum Romanorum Vitis,' but his authorship of it is very doubtful. The best edition of the works of Luitprand is that of Antwerp, 1640, 'Luitprandi Opera quæ extant,' with very copious notes, by Jerome de la Higuera and L. Ramirez de Prado, with a dissertation at the end on the Diptychon Toletanum.

LIVA'DIA. [BŒOTIA.]

LIVE STOCK. The animals necessary for the stocking and cultivation of a farm, and those which are kept on it for profit, or for the sake of their dung, are called the live stock of the farm, in contradistinction to the dead stock, which consists of the implements of husbandry and the produce stored up for use.

The live stock on a farm must vary according to circumstances. The number of horses or oxen kept for the cultivation of the land and other farming operations should be exactly proportioned to the work to be done. If they are too few, none of the operations will be performed in their proper time, and the crops will suffer in consequence. If there are too many, the surplus beyond what is strictly required is maintained out of the profits of the farm. To have the exact number of animals which will give the greatest profit is one of the most important problems which a farmer has to solve: what may be very profitable in one case may be the reverse in another; and, as a general maxim, it may be laid down, that the fewer mouths he has to feed, unless they produce an evident profit, the less loss he is likely to incur. But this rule admits of many exceptions. It is of great importance, in taking a farm, to calculate the extent of the arable land, so that it can be properly cultivated by a certain number of pairs of horses or oxen. It is an old measure of land to divide it into so many ploughs, that is, so many portions which can be tilled with one plough each. When there are several of these, it is useful to have an odd horse over the usual number required for two or three ploughs, to relieve the others occasionally. The work is thus done more regularly and with greater ease. Where there are two ploughs with two horses each, a fifth horse should be kept, and so in proportion for a greater number. The odd horse will always be found extremely useful, if not indispensable, and the expense of his keep will be amply repaid by the regularity and ease with which the whole work of the farm will be done, and the relief which occasional rest will give to the other horses.

The other part of the live stock kept on a farm must depend on various circumstances. Where there is good grazing land, the profit on the improvement of the live stock, or their produce, is evident and easily ascertained. But where animals are kept upon artificial food or fatted in stalls, it is often a difficult question to answer, whether there is a profit on their keep or not. In most cases the manure which their dung and litter afford is the chief object for which they are kept. If manure could be obtained in sufficient quantities to recruit the land, at a reasonable price, might often be more advantageous to sell off all the hay ıd straw of a farm, and to keep only the cattle necessary till the ground or supply the farmer's family. But this ın only be the case in the immediate neighbourhood of ırge towns. In the country at a greater distance no ma- ure can be purchased; it must consequently be produced ı the farm; and for this purpose live stock must be kept, ven at a loss. The management and feeding of live stock therefore an important part of husbandry. The object of ıe farmer is principally to obtain manure for his land, and he can do this, and at the same time gain something on ıe stock by which it is obtained, he greatly increases his rofits. Hence much more skill has been displayed in the lection of profitable stock than in the improvement of llage. Some men have made great profits by improving ıe breed of cattle and sheep, by selecting the animals hich will fatten most readily, and by feeding them economically. It requires much experience and nice calculations ascertain what stock is most profitable on different kinds land and in various situations. Unless very minute ac- ounts be kept, the result can never be exactly known. It not always the beast which brings most money in the arket that has been most profitable; and many an animal hich has been praised and admired has caused a heavy ss to the feeder. Unless a man breeds the animals which e to be fatted, he must frequently buy and sell; and an curate knowledge of the qualities of live stock and their lue, both lean and fat, is indispensable. However honest ay be the salesman he may employ, he cannot expect him feel the same interest in a purchase or sale, for which he paid his commission, as the person whose profit or loss pends on a judicious selection and a good bargain. Every rmer therefore should endeavour to acquire a thorough ıowledge of stock, and carefully attend all markets within s reach to watch the fluctuation in the prices. It will ınerally be found that the principal profit in feeding stock the manure, and to this the greatest attention should be rected. A little management will often greatly increase ıth the quantity and quality of this indispensable substance, and make all the difference between a loss and a ofit in the keeping of stock. [MANURE.]

LIVER. The liver is the secreting organ or gland by hich the bile is formed. Its existence has been traced ry low in the scale of animals; and parts supposed to have analogous function have been found in insects, but their ıture is at present a disputed question. The differences regard to size, form, and colour, which the liver presents in the higher animals (mammalia, birds, reptiles, nphibia, and fishes), are of no great importance.

In man the liver is a large solid viscus, of a reddish own or mottled red and yellow colour, situated immediately neath the diaphragm, in the right hypochondriac and ırtly in the epigastric region of the abdomen. [ABDOMEN.] hen enlarged, it can be felt by the hand applied below ıe ribs on the right side. It is flattened in the vertical irection, is thinner at its anterior than at its posterior order, and its outline, when viewed from above, is irregularly ovoid. The upper surface, which is convex, is applied the diaphragm; the lower, which is irregularly concave, es above and in contact with the stomach, large intestine, ıd right kidney, has attached to it the gall-bladder, and resents two deep furrows, which divide it into several compartments, termed by anatomists lobes. Of the furrows, ıe running from before backwards (the longitudinal fissure) transmitted, during uterine life, the vessel which conveyed the blood from the placenta to the heart of the fœtus; afterwards contains merely the cord-like remains of that essel, now impervious in the greater part of its extent. The cond furrow, in the under surface of the liver, is called the ansverse fissure, since it crosses the former at right angles, ing however chiefly to its right side; it serves to allow ıe entrance of blood-vessels and nerves to the liver and ıe exit of the bile-ducts. Like other viscera of the abdomen, the liver receives an investment from the lining mem rane of that cavity, the peritoneum, which, being reflected om it at different points, forms broad bands connecting ıe liver with surrounding parts.

The substance of glands generally is constituted of minute mified or convoluted canals, closed at their radicle extremity, and communicating only with the principal duct, by hich the secretion is conveyed away, and of a great number of blood-vessels which surround the above-mentioned canals in their whole extent, and afford the component matters of the secretion; these matters find their way into the interior of the glandular canals, not by distinct openings from the blood-vessels, but by transudation through their walls. In the human subject all other glands than the liver receive one kind of blood only, namely, arterial blood, from which the components of the secretion are derived, and the organ at the same time nourished, and the only veins are those which convey away the same blood after it is rendered venous by the changes it undergoes in the gland. But the liver, like the lungs in man and the kidneys also in some animals, receives two kinds of blood—arterial blood in small quantity, destined principally for the nourishment of the gland, and venous blood in much larger quantity, from which the bile is principally formed. The vessel which brings the arterial blood, the hepatic artery, is small, and comes off the aorta [AORTA], together with the arteries supplying the stomach, spleen, duodenum, and omentum. The venous blood is brought by the portal vein, a large vessel resulting from the union of all the veins returning the blood from the spleen, omentum, pancreas, and gall-bladder, and from the viscera directly engaged in the function of digestion, namely, the stomach and intestines. The hepatic artery and portal vein enter the liver at the transverse fissure or furrow of its inferior surface, where the bile-duct issues, and ramify together with the branches of that duct through the substance of the organ. After the materials for the nutrition of the liver itself, and for the secretion of the bile, have been derived from the blood of the two sets of vessels already mentioned, it is returned to the general circulation by a third set, the hepatic veins, which issue from the liver at its posterior border, and immediately enter the inferior vena cava near the heart.

The ultimate arrangement of these different blood-vessels in the liver is very peculiar: it was discovered a few years since by Mr. Kiernan. When the substance of the liver is torn, it is seen to be composed of innumerable granules of about the size of a pin's head; each of these contains the elements of a liver. They are connected most intimately with the branches of the hepatic vein, a small twig of which is contained in the interior of each, while on their exterior surface and in their interstices run branches of the portal vein, hepatic artery, and bile-duct. The mass of each granule or lobule is constituted in great part of a close network of capillary blood-vessels, which communicate on the exterior with the small branches of the portal, and on the interior with the twig of the hepatic vein. The blood brought by the portal vein therefore is poured into the capillary net-work of each granule or lobule of the liver, and after yielding in it the constituents of the bile, is received into the branches of the hepatic vein, whence it is transmitted to the general vascular system. The branches of the hepatic artery soon become very minute on the exterior of the lobules, and few can be traced into their interior; it is probable that, after having nourished the coats of the vessels and ducts, and other tissues of the liver, the blood of the hepatic artery is poured into the minute net-work formed by the ultimate division of the portal vein, and contributes with the blood of that vein to yield the constituents of the bile.

The form and disposition, in the liver, of the primitive radicles of the secreting canals or bile-ducts, have not been determined. In all other known glands the radicles of the ducts commence by isolated closed extremities; but this has not been demonstrated in the case of the liver, and some anatomists have imagined that the ducts arise by a net-work or reticular plexus in the interior of each hepatic lobule or granule: however this may be, we must suppose that they penetrate into the interior of the lobules, so as to be brought into contact with the delicate reticular terminations of the portal vein, in order to receive the components of the bile; and the yellow colour of these lobules, when not much congested with blood, is most probably owing to the presence of minute biliary canals filled with their secretion.

The biliary canals reduced in number by successive reunion to two tubes, one from the right, the other from the left lobe of the liver, issue at the transverse fissure of its under surface, there soon unite, and form one main trunk, the hepatic duct. After running a short distance together with the portal vein, hepatic artery, and nerves, in a quantity of dense cellular tissue enclosed within the fold of the peritoneum that connects the liver with the stomach, the lesser omentum [PERITONEUM], the hepatic duct meets and unites with the duct of the gall-bladder, or cystic duct. The tube resulting from the junction of the hepatic with the cystic duct is called the ductus communis choledochus: it is about three and a half inches in length, and terminates by opening, together with the duct of the pancreas, into the portion of the intestine named duodenum, at the distance of a few inches from the stomach.

The gall-bladder is a pyriform membranous sac, lodged in a shallow depression at the inferior surface of the liver, which communicates, as we have stated, with the excretory duct of the liver, by means of a tube called the cystic duct. At times, when a supply of bile is not required in the intestinal canal—for instance, during fasting—the bile flowing from the liver is impeded in its progress through the ductus communis choledochus into the intestine, and is consequently obliged to regurgitate through the cystic duct into the gall-bladder, which serves as a temporary reservoir for the secretion, discharging it again when the presence of bile is required in the intestine to aid the digestive process. At the neck of the gall-bladder, close to its termination in the cystic duct, the lining membrane forms a spiral fold, which seems destined to retard the flow of the bile from the reservoir. The gall-bladder is not constantly present; the animals in which it does not exist are for the most part, though not universally, herbivorous, and such in which digestion is constantly going on, and a reservoir for bile consequently not required. But many herbivorous animals have a gall-bladder; and sometimes where it is absent the bile-duct presents a considerable dilatation of its cavity near the intestine: such is the case, for example, in the horse and elephant.

The *function of the liver* is manifold and important. The analysis of the fluid which it secretes shows that it frees the blood from an excess of matters composed of carbon and hydrogen; and by this means, and probably also by effecting some change in the matters which have been added to the blood during its circulation through the viscera of the abdomen, the liver assists in preparing that fluid for the nutrition of the body. The bile seems also to have a direct influence in the formation of the chyle, the nutritive fluid derived from the food; and some of its ingredients, serve as a natural stimulus of the peristaltic action of the intestines. [BILE.]

Development of the Liver. The liver, like other glands, is developed in the embryo as a diverticulum, or small sac protruded from the intestinal canal. The walls of this diverticulum become thickened, and in them are formed the secreting canals and other component parts of the organ, while its neck becomes narrowed and lengthened, and forms the excretory duct. Subsequently the gall-bladder is in its turn developed as a diverticulum from this duct.

LIVER, DISEASES OF. The liver is subject to all those general morbid changes which, depending on disordered actions of the blood-vessels, modification of the nutritive process, or alterations in the blood itself, may affect most organized parts of the body; such are inflammation (hepatitis), acute and chronic; hypertrophy and atrophy; induration and softening; and the different kind of tumours or transformations of tissue, carcinoma, or cancer, medullary sarcoma, fungus hæmatodes, melanosis, and scrofulous tubercle. It is occasionally infested by parasitic animals (hydatids), which may likewise affect other parts of the body.

But the liver is also liable to other diseases which appertain to it specially, and are connected with its function—secretion. The chemical changes which give rise to the formation of bile in the liver may be so deranged, that one or all of the ingredients of that fluid are increased or diminished in quantity, or vitiated in quality, and such disorder of the secreting process may manifest itself in several ways: the imperfectly formed fluid passing into the intestines may cause irritation there, and consequently diarrhœa; or being absorbed into the blood, may produce jaundice and its concomitant symptoms; or some of the ingredients of the bile may concrete into solid masses in the ducts of the liver or the gall-bladder, forming gallstones. The diseased state of the liver in which it becomes impregnated with an unnatural quantity of fatty matter may also be reckoned among the diseases appertaining to the special function of the organ, for the bile naturally contains a large proportion of fatty matter (cholesterine); though the chemical composition of this substance, and that of the oil or fat with which the liver is impregnated in disease, appears to be different.

Acute hepatitis, when it exists in a severe degree, is indicated pretty distinctly not only by the general signs of inflammation and symptomatic fever, such as thirst, heat, and dryness of the skin, increased rapidity of the pulse, &c., but also by local symptoms, which point more especially to the seat of the disease, namely, pain and tenderness on pressure beneath the ribs on the right side, difficult breathing from the liver being pressed upon by the diaphragm when air is drawn into the lungs, and a short dry cough, dependent either on the extension of the inflammation to the diaphragm, or a sympathetic affection of the parts engaged in respiration. The pain in hepatitis so frequently extends to the right shoulder, that pain in that situation has been considered characteristic of disease of the liver. Vomiting is a common attendant on hepatitis, as on inflammation of most of the abdominal viscera. Another symptom is jaundice, which in this case is a consequence of the inflammatory action having disturbed the process by which the components of the bile are formed and separated from the blood.

Inflammation of the liver may terminate in suppuration, and the formation of one or more abscesses, which sometimes attain a very large size in this organ, protrude externally, and even burst and discharge their contents through an opening in the skin.

Acute inflammation may be produced in the liver by any of the influences which give rise to it in other organs; but while the lungs are more subject to this affection in cold climates, the liver is especially liable to it in hot countries. The cause of this difference is not at present known; the mere heat of the atmosphere however, or some circumstances connected with it, seem to be influential, since even in our own climate hepatitis, and the disorders of the secreting action of the liver, which give rise to diarrhœa, are particularly frequent in the hot season of the year.

Chronic hepatitis is indicated by the presence, in a less violent degree, of many of the symptoms which attend the acute disease. Thus, a dull pain or sense of weight in the right side, with some degree of tenderness in the same situation, pain in the right shoulder, slight jaundice or sallowness of the skin, and disorder of the stomach and digestive organs generally, are the most constant signs. It is frequently difficult to distinguish mere chronic inflammation of the liver without enlargement from some disordered states of the stomach and bowels, which sympathize so much with it, and hence has arisen the popular error of designating any chronic disorder of the digestive organs 'a liver complaint.' We cannot be surprised at this sympathy between the liver, stomach, and bowels, and other viscera of the abdomen in disease, since we know that they are all engaged in one great function—digestion; and are in the healthy state associated together in their action by a natural sympathy for the purpose of co-operation in that function.

The liver is very apt to become enlarged by chronic inflammation, and then can be felt externally. Or such changes may be produced in it by hypertrophy or atrophy of one or more of the tissues composing it, or by the formation of a new tissue, that the passage of the blood through it is impeded, and dropsy of the abdomen (ascites) is the result; this effect however is sometimes a consequence of the chronic inflammation of the liver having extended to the whole lining membrane of the abdominal cavity.

Of the structural diseases, not inflammatory in their nature, some, as scrofulous tubercles, are rarely met with in the liver, others, as carcinoma, are more frequent in it than in most other internal organs, except the intestinal canal. There are no certain means of ascertaining the presence of these diseases in the liver, until the tumours which they form attain such a size as to be felt externally; though it should be suspected, when the general states of the body marking the carcinomatous and tubercular diathesis exist, and still more when these diseases are known to be present in other parts, if at the same time there are marks of irritation and disturbed action of the liver.

The 'fatty liver' is a frequent attendant on pulmonary phthisis: it cannot be recognised by any signs during life. The liver in man, as in many animals, particularly the sheep, is, as we have said, subject to become the seat of parasitic living creatures—hydatids. These are generally contained in great numbers in a firm general cyst, which not uncommonly protrudes externally, and bursts, or is opened by a lancet, when numerous pellucid bladder-like bodies of different sizes, floating in a transparent fluid, escape.

The nature of the changes to which the secreting action of the liver is prone is but little understood; a further consideration of these changes would be misplaced here.

The *treatment* of diseases of the liver is regulated by the general principles according to which the cure of diseases in other parts is attempted, and will of course vary with the nature of the particular affection requiring it.

LIVERPOOL, a municipal and parliamentary borough and seaport of Lancashire, stands on the right or east side of the æstuary of the Mersey, in 53° 24′ N. lat. and 2° 58′ W. long. The etymology of the name Liverpool is, according to the popular belief, derived from the name of a bird called a liver or lever, which was said to frequent the site of the town, great part of which was formerly a marshy pool, which was filled and emptied with the flowing and ebbing of the tide. In conformity with this popular tradition, the corporate seal of the town bears the figure of a bird, which however, as there represented, is of a species wholly unknown at the present day, if indeed, as is much doubted, such a bird ever existed. The name of the town has also been derived, and with at least an equal appearance of probability, from the Welsh words Llêr pwll, signifying 'place on the pool,' and it is certain that antiently the whole of the æstuary of the Mersey, as far up as Runcorn, was called Lyrpul, Lyrpoole, or Litherpool. In confirmation of this etymology, it may be observed that the name of Liverpool is pronounced 'Lerpool' by many of the country-people who live in the neighbourhood.

No mention is made of Liverpool in Domesday-book, though it contains the names of several places in the vicinity, and also the grant of all the parts between the Ribble and the Mersey to Roger of Poictiers, by whom it is said the castle of Liverpool was built. This was probably the origin of an English town and port which are now second in commercial importance to London only. An act was passed in 1659 for demolishing the castle of Liverpool, on the site of which St. George's church now stands.

In 1173 the town received its first charter from Henry II., a mark of royal favour occasioned by the importance of the place as a means of communication with Ireland. A second charter was received from John in 1207; and a third, constituting it a free borough for ever, was obtained from Henry III. in 1227. The town flourished under the privileges thus granted. During the civil war it held out for twenty-four days against the army under Prince Rupert; at the expiration of that term the place was taken, and many of the garrison and inhabitants were put to the sword. Until the close of the seventeenth century Liverpool was a chapelry attached to the parish of Walton, but at that time it was made a separate parish, the population of which was about 5000 souls. In 1650 it is said there were only fifteen ships belonging to the port. Towards the middle of the next century three docks were constructed for the convenience of the shipping employed in the African and West Indian trades. The chief exports were then, as at present, furnished by the manufacturers of Yorkshire and Manchester, and consisted of hardwares, cutlery, and woollen goods. These were shipped in slave-ships to the coast of Africa, where they were bartered for negroes, who were conveyed to the West India plantations; the ships returning thence loaded with sugar and rum. In 1764 more than half the African slave-trade was carried on by the merchants of Liverpool. That trade has happily ceased since 1806, and this town has obtained an ample compensation for the loss in the rapid extension of the cotton manufacture, which having its principal seat in Lancashire and the adjoining county of Cheshire, Liverpool has become the port where the great bulk of the raw material of the manufacture is received, and whence the exports of manufactured goods are chiefly made to all parts of the world. Still more recently, and especially since the employment of steam-vessels for the conveyance of merchandise, this port has enjoyed a very large proportion of the trade between England and Ireland, for the prosecution of which it is peculiarly well situated. This intercourse having been placed upon the footing of a coasting-trade, and no entries of the goods conveyed being required by the custom-house, it is not possible to give any accurate account of its extent. Some idea of its importance may however be formed from the following statement of the quantity and value of animals and agricultural produce brought into Liverpool from Ireland in the years 1831, 1832, and 1837, compiled by the managers of the steam-vessels engaged in that trade:—

	1831.		1832.		1837.	
	Quant.	Value.	Quant.	Value.	Quant.	Value.
		£		£		£
Cows . . (number)	90,715	907,150	69,624	765,864	84,710	1,365,360
Calves . . „ .	4,196	2,990	1,694	10,164	316	711
Horses . . „ .	296	5,920	679	13,580	3,414	68,280
Mules . . „ .	243	3,645	29	290	319	2,552
Sheep . . „ .	134,762	235,834	74,260	129,955	225,050	450,100
Lambs . . „ .	25,725	25,725	24,077	24,077	24,669	22,202
Pigs . . . „ .	156,001	585,004	149,090	484,543	595,422	1,488,555
Eggs . . (crates)	2,506	50,120	4,097	81,940		
Wheat (quarters)	277,060	831,180	338,649	948,217		
Oats . . . „ .	380,679	532,951	325,720	309,434		
Barley . . „ .	21,328	37,324	14,486	24,626		
Rye . . . „ .	613	920	213	320		
Beans . . „ .	8,452	16,904	7,927	12,683		
Peas . . . „ .	1,724	3,448	1,233	1,973		
Malt . . . „ .	6,850	17,125	6,009	15,023		
Meal . . (loads)	149,816	187,270	169,817	203,780		
Flour . (sacks)	93,154	209,596	177,252	407,680		
Bacon . (bales)	13,099	65,495	10,771	64,626		
Pork (barl. & ½ barl.)	15,480	45,300	13,595	41,430		
Beef (tiers. & barls.)	7,580	30,728	9,044	41,142		
Hams . (hhds)	590	11,800	817	19,608		
Butter . (cwts.)	5,754	11,508	10,348	21,731		
„ . . (firkins)	258,087	645,217	992,830	775,999		
„ . (half do.)	19,217	24,021	15,861	21,412		
Lard . . (tierces)	465	3,720	693	6,583		
„ . (firkins)	4,542	6,813	10,800	17,820		
		4,497,708		4,444,500		3,397,760

The returns for 1837 include only seven of the twenty-six articles enumerated in the previous years, but as regards some of those seven exhibit a very important increase.

The number and classification of houses in the borough, assessed to the poor-rate in 1834-5, were as follows:—

64	at	£3	£192
153	„	4	612
628	„	5	3,140
3,337	„	6	20,022
3,303	„	7	23,121
2,795	„	8	22,360
1,755	„	9	15,795
2,026	„	10	20,260
1,056	„	11	11,616
1,372	„	12	16,464
2,450	„	13	31,850
949	„	14	13,286
461	„	15	6,915
761	„	16	12,176
220	„	17	3,740
576	„	18	10,368
351	„	19	6,669
296	„	20	5,920
6,132	above	20	247,390
28,685			471,896
1,092	Warehouses		118,616
3,425	Breweries, work-shops, &c.		129,865
Total 33,202			720,377

No considerable town in England has received greater improvement during the past half-century than Liverpool. Before that time the streets were narrow and inconvenient, and the buildings were wholly devoid of architectural beauty, but successive alterations have given to the town an amount of commodiousness and elegance not to be met with in any other commercial port in this country. This altered condition has been produced by the exertions of the corporation, in whom is vested the property of a great proportion of the houses. As the leases of these have progressively fallen in, they have been renewed only on the condition of expending the sums necessary for the required embellishment. The value of the corporation estates is estimated at three millions of money, and the annual income derived from rents and dock-dues has of late increased to upwards of 320,000*l.* A great proportion of this income has been devoted to the improvement of the town, including the building of churches, hospitals, and other charitable and public edifices. The sum expended in these objects, including the cost of widening streets, between 1786 and 1838, is stated to have amounted to 1,668,500*l.* The disbursements of the corporation have so far exceeded its income that it has incurred a considerable debt, and in October 1832, when a Report was made on the subject, the amount of its outstanding bonds was 792,000*l.*

The most important public buildings are the town-hall, the Exchange buildings, and the custom-house. The building of the town-hall was begun in 1749, but was not completed in its present form and extent until near the end of the last century. The interior was accidentally burnt in 1795, and restored, with many improvements, at an expense of 110,000*l.* The ground-floor of this building contains the council-room, several committee rooms, the mayor's, town-clerk's, treasurer's, and town-surveyor's offices. The principal story is approached by a very handsome staircase, and contains a very fine suite of rooms, which are magnificently furnished. The saloon is 30 feet 6 inches long and 26 feet 6 inches wide. The two drawing-rooms are respectively 32½ feet and 30 feet long, and 27 feet wide. The large ball-room is 89 feet long, 41½ feet wide, and 40 feet high; the second ball-room is 61 feet by 28, and 26 feet high; and the banquet-room, in which the mayor receives his guests, is 50 feet by 30, and 25 feet high. The whole of these rooms communicate with each other. The staircase is lighted by means of a dome with lateral windows: the height from the floor of the building to the centre of the dome is 106 feet. The staircase is ornamented by a colossal statue of Canning, by Chantrey, and surmounting the dome is a colossal figure of Britannia.

The Exchange buildings form with the town-hall three sides of a quadrangular area, which is used by the merchants of Liverpool as an Exchange. This quadrangle is 197 feet long from north to south, and 178 feet wide; it therefore contains 35,066 square feet, which is more than twice the size of the recently destroyed Royal Exchange of London. The buildings which form the west side of the area are occupied as offices by merchants; while the east side comprises a news-room, 94 feet by 52 feet, which is frequented by the merchants and brokers; and an underwriters' room above, of somewhat smaller dimensions. The architecture of the two wings harmonises with that of the town-hall. In the centre of the area is a bronze monument, erected in honour of Lord Nelson. This monument, which is executed in bronze, consists of a marble basement and a circular pedestal, supporting figures emblematical of Nelson's principal victories. The statue of the dying admiral rests one foot on a prostrate enemy, and the other on a cannon; and he is receiving upon his sword a naval crown from Victory.

The custom-house, in which are also contained the dock offices, the excise-office, and where it is intended shortly to place the post-office and the office for the distribution of stamps, is situated on the site, now filled up for that purpose, of the old dock. The land on which it stands, valued at 90,000*l.*, was given by the corporation, which also undertook to expend 175,000*l.* in the erection of the building, under an agreement with the government, by which, in consideration of 150,000*l.*, to be paid by annual instalments of 25,000*l.* each to the corporation, the latter was bound to make over the property to the government at the end of twenty years. The extreme length, measuring from east to west, is 466 feet 8 inches. The principal front faces the north, and in the centre there is an octostyle Ionic portico, with columns of five feet diameter; and at each end are projecting wings, each of which is 94 feet wide. The basement is used for storing bonded goods; the west wing is occupied by different offices of the custom-house; and the centre contains the 'long-room' of that establishment and the approaches to other parts of the building. The east wing contains the excise-office and the dock offices, and will also afford accommodation for the post-office and the stamp-office. The long-room is 146 feet in length, 70 feet wide, and 45 feet high, and is surmounted by a dome 50 feet high: the passages and staircases of the wings are lighted by means of two smaller domes. The height of the rooms in the principal story is 20 feet, in the second story 21 feet 6 inches, and in the attics 14 feet 8 inches.

Liverpool contains 28 churches, some of which are handsome modern buildings; besides numerous chapels and meeting-houses, belonging to the Roman Catholics and various denominations of Protestant Dissenters. The church dedicated to Saint Nicholas, the tutelar saint of mariners, according to the Romish calendar, is the oldest place of worship in Liverpool, having existed as a chapel-of-ease under Walton parish before the town became a separate parish; it stands near the river, at a short distance from the town-hall. The body of the church was rebuilt in 1774; and the tower, which fell down in 1810, has since been rebuilt in a good style: it has a peal of twelve bells. Many of the churches were built with the funds of the corporation, but others have been erected at the cost of private individuals under private acts of parliament. The town contains many buildings devoted to charitable purposes. The workhouse, which is one of the best managed in the kingdom, is almost like a little town: it will accommodate about 1800 people; a fever hospital belongs to it. The infirmary, originally opened in 1749, was rebuilt on a better site in 1824 at the cost of 27,800*l.* It contains 234 beds for male and female patients. The lunatic asylum, which is capable of accommodating sixty patients, is a neat and commodious building, with spacious cells and day rooms, and furnished with warm baths. The foundation stone of this asylum was laid in January, 1829, and the building was erected at the cost of about 11,000*l.* A building previously used for the same purpose is now used as a barrack. Besides these there are two smaller hospitals, two dispensaries, and an ophthalmic infirmary. The Blue-coat School, established in 1709, has accommodation for 250 boys and 100 girls, who are educated, boarded, and clothed gratis. There are also charitable schools for the blind, and for the deaf and dumb, two corporation free-schools, and numerous other schools supported by different denominations of Christians. The Mechanics' Institution in Mount Street is built on ground given by the corporation, and cost 11,000*l.* The theatre, or lecture-room, will contain 1200 persons; it was publicly opened during the visit of the British Association at Liverpool in 1837. Attached to this institution are schools, in which, for very moderate charges, boys receive an education according to the station which they are intended to occupy. There is no town in the kingdom which, in proportion to its size and population, is better provided than Liverpool with scientific and literary institutions. The Royal Institution, formed in 1814 by Mr. Roscoe, by shares or subscriptions of 100*l.* each, was opened in 1817, and in 1822 the subscribers were incorporated by royal charter. The building has a frontage of 146 feet, and contains numerous spacious apartments, among which is a lecture-room, capable of accommodating 500 persons. The second and third stories of the building are occupied by the Museum of Natural History, which is the largest and most valuable in that part of the kingdom. The institution likewise possesses many valuable paintings; casts of the Ægina Marbles and the Phigaleian Frieze, and an extensive collection of philosophical apparatus. Courses of lectures are given on literature, on the various branches of physical science, and on the different branches of medical knowledge. There is also a grammar-school attached to the institution. The Literary, Scientific, and Commercial Institution was set on foot in 1835 by a few young men engaged in commercial pursuits, and already contains a library of 2200 volumes. It is supported by an annual subscription of 2*l.* from the members, for which they have the advantage of a news-room, lectures on various literary and philosophical subjects, and classes for the acquisition of languages and other branches of learning. The Medical Institution, recently built at the cost of about 3000*l.*, contributed chiefly by members of the medical profession, contains a museum and library, and comprises various halls and committee-rooms, and a theatre capable of holding 500 persons.

The borough gaol is a large building, on the plan recommended by Howard; it has been principally used for the confinement of debtors. The County House of Correction at Kirkdale stands within the limits of the borough; it contains more than 400 cells, and is calculated for the reception of 500 prisoners. This establishment was formerly situated at Preston, and was removed to Liverpool because the largest proportion of the prisoners being furnished from its population, a considerable expense in their conveyance would by that means be saved to the county.

narket-places in Liverpool are upon an extensive Saint John's Market, which stands in the centre of n, covers a space of 1¾ acres, being 550 feet long 5 feet wide, the whole under one roof, supported by lars. Meat, poultry, fruit, and garden vegetables, y sold in this market, but the principal market-days lnesday and Saturday. The fish-market is on the side of the street in which Saint John's Market There are several smaller market-places in different the town.

principal places of public amusement are:—the, on the east side of Williamson Square; the Royal heatre, in Great Charlotte Street; the Liver Theatre, top of Church Street; the Wellington Assembly- in Mount Pleasant; and the Rotunda, in Bold There are also a large and well-stocked botanic at Edge Hill and a zoological garden in Derby

al cemeteries on a large scale have lately been made ear Liverpool: that of St. James, which is formed n old stone-quarry, contains the statue of Mr. Hus- who is interred there.

own is plentifully supplied with water by a company ed with the corporation, formed in January, 1800, corporated by act of parliament, and by a second y, which brings its water from the village of Bootle, iree miles from the town to the north. The streets ps are well lighted with coal-gas, supplied by two es, which make handsome returns to the pro-

rowth of the town will be seen from the following nt of its population at different times, from the end eventeenth century:—

s.	Population.	Years.	Population.
0	5,714	1770	35,600
0	8,168	1777	34,107
0	11,833	1790	55,732
0	12,074	1801	77,708
2	18,000	1811	94,376
6	18,500	1821	118,972
0	25,787	1831	165,221

e Municipal Corporation Act (5 & 6 Wm. IV., c. e council consists of a mayor, 16 aldermen (one for the sixteen wards into which the town is divided), councillors, one-third of whom are elected every ose who vacate their office being eligible for re-

The mayor is a justice of the peace during his office, and for one year after. The aldermen serve ears: one-half are elected every three years. The thus constituted has the right, under a private act ment passed in 1835, of nominating persons to fill e offices, and is empowered to make laws for regulating the police of the town, of the docks, and of the port generally, for lighting and watching the town, and for the suppression of disorderly and immoral practices. General sessions of the peace are held four times in the year, in which the recorder, who is appointed by the crown, presides as judge. The assizes for the hundreds of Salford and West Derby, forming the southern division of the county, are held in the town. Liverpool is a parliamentary borough, sending two members to the House of Commons. The right of voting rests in the householders occupying premises of the annual value of 10*l.* and upwards, and in all free burgesses not receiving alms. The number of persons registered as electors in these two classes, in 1836 and 1837, respectively was:—

	1836.	1837.
Householders paying rates	10,252	10,715
Freemen	3,197	3,175
	13,449	13,890

The number of actual electors is not so great as is indicated by the registers, because some names are entered in both capacities. The number who gave their votes at the general election in 1837 was 9091, of whom 6670 were householders, and 2421 were freemen.

The living is a rectory, divided into 'two *medieties*—the new church of St. Peter, and the parochial chapelry of St. Nicholas.'

The progress of Liverpool as a commercial port may be traced from the receipt of customs duties during the last 100 years, which has been as follows:—

Years.	Customs Receipt.	Years.	Customs Receipt.	Years.	Customs Receipt.
1733	£92,466	1800	1,058 578	1829	3,315,041
1750	215,961	1805	1,766 370	1830	3,562,114
1755	202 367	1810	2,676,766	1831	3,599 206
1760	248,312	1815	2,360,967	1832	3,925,062
1765	269,435	1820	1,488,072	1833	3,733,132
1770	231 994	1824	1,984,522	1834	3,846,306
1775	274,685	1826	3,087 651	1835	4,272,84,
1780	188,830	1827	3,308,904	1836	4 450,426
1785	680,928	1828	3,180,503	1837	4,351,496
1795	469,438				

The growth of the trade of Liverpool has been further shown by the number of vessels unloaded in the docks, and the amount of dues collected on the same. [Dock.] The number of ships unloaded and amount of dues collected in each of the years ending 24th of June, 1837 and 1838, were,—

	Ships.	Dock Dues.
1837	15,038	£191,330
1838	14,820	161,843

The course of the trade of the port is shown by the following statement:—

and Tonnage of Vessels Entered Inwards and Cleared from the Port of Liverpool during the year 1837, *under each of the different Heads below stated.*

	INWARDS.				OUTWARDS.			
	British.		Foreign.		British.		Foreign.	
	Ships.	Tons.	Ships.	Tons.	Ships.	Tons.	Ships.	Tons.
generally	548	81,739	471	78,517	587	92,385	502	86,208
	96	24,069	5	469	93	21,867	1	92
	133	47,718	..	..	125	48,639	1	463
, *viz.*:—								
h Northern Colonies	328	146,588	..	..	328	123,288	..	..
West Indies	197	51,930	..	..	219	58,733	..	..
n West Indies	12	2,298	2	401	39	7,921	18	4,647
d States	161	64,841	504	233,258	134	65,904	486	228,304
American States	210	47,944	3	743	210	50,749	4	839
Total	1,685	467,127	985	313,388	1,735	469,486	1,012	320,553
s, *viz.*:—								
land	..	..	..	..	..	..	..	..
f Guernsey, Jersey, &c.	9	715	1	59	26	3,090	..	..
f Man	246	16,411	1	87	211	11,824	..	..
Trade	3,339	466,230	..	..	2,728	372,067	..	..
Coasters	5,002	440,326	..	..	4,746	410,659	..	..
Total	10,281	1,390,809	987	313,534	9,446	1,267,126	1,012	320,553

It will be seen from this statement that very nearly two-fifths of the tonnage inwards and outwards are engaged in the trade with the United States of America, and that of the shipping so engaged nearly four-fifths are under a foreign flag. It will be further observed, that the intercourse with Ireland is about equal in amount to that kept up with every port in Great Britain.

Liverpool has benefited more than any port in the kingdom (London alone excepted) from the application of steam-power to navigation. Steam-ships of the first class proceed to and arrive from Dublin daily. With Drogheda the intercourse is kept up four times a-week; with Belfast three times a-week; with Waterford, Newry, and Londonderry, twice every week; with Glasgow daily; with the Isle of Man, Beaumaris, Bangor, Menai Bridge, and Carnarvon, as frequently; and throughout every day the Mersey is enlivened by steam-vessels, conveying passengers to and from the towns and villages on the opposite side of the river.

The inland trade of Liverpool is much assisted by means of canals, the most important of which in extent is the Leeds and Liverpool canal, 128 miles long. The Mersey and Irwell navigation served until the opening of the Liverpool and Manchester railroad for the conveyance of bulky and heavy goods to and from Manchester. The Duke of Bridgewater's canal connects the Mersey with Birmingham and Staffordshire, and, joining the Grand Trunk canal, thus perfects the communication with London. The trade with North Wales, through the western part of Cheshire, is carried on by means of the Ellesmere canal; and the river Weaver navigation connects Liverpool with the salt district and the heart of Cheshire. [CANALS.] The modern adaptation of iron railways for the rapid conveyance of goods and passengers was first brought into practical operation by the Liverpool and Manchester railway, which was opened for use in September, 1830. The traffic upon this line from that time to Midsummer, 1836, since which date such particulars have not been made public, was as follows:

		Merchandise. Tons.	Coal. Tons.	Passengers. Number.
From	16 Sept. to 31 Dec., 1830	1,433	2,630	71,951
„	1 Jan. to 30 June, 1831	43,070	2,889	188,726
„	1 July to 31 Dec.	65,488	8,396	256,321
„	1 Jan. to 30 June, 1832	72,601	29,456	174,122
„	1 July to 31 Dec.	86,842	39,940	182,823
„	1 Jan. to 30 June, 1833	96,457	41,375	171,421
„	1 July to 31 Dec.	98,247	40,134	215,071
„	1 Jan. to 30 June, 1834	104,356	46,039	200,676
„	1 July to 31 Dec.	106,380	53,298	235,961
„	1 Jan. to 30 June, 1835	113,647	55,444	205,741
„	1 July to 31 Dec.	116,982	60,802	268,106
„	1 Jan. to 30 June, 1836	117,617	68,893	222,848
		1,023,120	449,296	2,393,767

From these figures, which do not include great numbers of cattle, sheep, and swine conveyed from Liverpool towards the interior of the country, it appears that in less than six years there were conveyed upon this railway nearly two millions and a half of passengers, and but little short of a million and a half tons of merchandise and coals. Exactly one century before the opening of this line, the town of Liverpool contained only one carriage, and no stage-coach came nearer to the town than Warrington, the traffic being then principally carried on by means of pack-horses. In 1760 there was only one stage-coach between Liverpool and London, and the journey required four days: the first mail-coach to London began to run on the 25th July, 1785. Now that the time required for the performance of this journey has been reduced, by means of the Grand Junction and Birmingham railways, to a ride of ten or eleven hours, the number of passengers must be reckoned by hundreds of thousands in the year, an alteration which adds another and an effective element towards the continued growth and prosperity of Liverpool.

It appeared from the annual bills of mortality printed at Easter, 1838, that the number of baptisms in the town and vicinity during the year was 10,145, the number of marriages 3017, and of burials 9979. Of the births and baptisms, there were belonging to the

Established Church	6,273
Roman Catholics	2,917
Presbyterians	116
Baptists	64
Independents 128, Unitarians 25, Methodists 107	260
Friends 13, Jews 33, other Dissenters 469	515
	10,145

Of the deaths in the parish, 6875 in number, there were—

Of persons under		2	years	2,483
„	Between	2 and 5	„	822
„	„	5 and 10	„	312
„	„	10 and 20	„	255
„	„	20 and 30	„	563
„	„	30 and 40	„	579
„	„	40 and 50	„	534
„	„	50 and 60	„	445
„	„	60 and 70	„	435
„	„	70 and 80	„	308
„	„	80 and 90	„	123
„	„	90 and 100	„	13
„	100 years and upwards			3
				6,875

For further particulars relating to canals and railroads connected with Liverpool see LANCASHIRE.

LIVIA. [AUGUSTUS.]

LI'VIUS, with his full name, **LU'CIUS LI'VIUS ANDRONI'CUS**, was the first person who introduced a regular drama upon the Roman stage. (Liv., vii. 2.) He is said to have been the slave and afterwards the freedman of M. Livius Salinator. The time and place of his birth are uncertain; but his first play was probably exhibited 240 B.C., in the year before Ennius was born. (Cic., *Brut.*, c. 18; *De Senect.*, c. 14; *Tuscul.*, i. 1; Gell., *Noct. Attic*, xvii. 21.) We learn from Livy the historian, that he acted in his own pieces, and that after his voice failed him, in consequence of the audience frequently demanding a repetition of their favourite passages, he introduced a boy to repeat the words, while he himself gave the proper gesticulations. (Liv., vii. 2.) The fragments of his works, which have come down to us, are too few to enable us to form any opinion respecting them: Cicero says that they were not worth being read a second time. (*Brut.*, c. 18.) They were however very popular at the time they were performed, and continued to be read in schools till a much later period. (Hor., *Epist.* ii., i. 69-73.) The hymns of Livius were sung on public occasions, in order to avert the threatened anger of the gods. (Liv., xxvii. 37.) Festus informs us (under *Scribas*) that the Romans paid distinguished honour to Livius, in consequence of the success which attended their arms in the second Punic War, after the public recitation of a hymn which he had composed. Livius wrote both tragedies and comedies: they appear, if we may judge from their names, to have been chiefly taken from the Greek writers. The titles, which have been preserved, are—Achilles, Adonis, Ægisthus, Ajax, Andromeda, Antiopa, Centauri, Equus Trojanus, Helena, Hermione, Ino, Lydius, Protesilaodamia, Serenus, Tereus, Teucer, Virgo.

LI'VIUS, TITUS, the Roman historian, was born at Patavium (Padua), B.C. 59. We possess very few particulars respecting his life. He appears to have lived at Rome, and to have been on intimate terms with Augustus, who used, according to Tacitus (*Ann.*, iv. 34), to call him a Pompeian, on account of the praises which he bestowed upon Pompey's party. He also appears to have superintended the studies of Claudius, who was afterwards emperor. (Suet., *Claud.*, c. 41.) He died A.D. 17, in his 76th year.

Livy's great work, which was originally published in 142 books, gave an account of the history of Rome, from the earliest period to the death of Drusus, B.C. 9. Of these books only 35 are now extant, namely, the first ten, which contain the history of the city to B.C. 293; and from the twenty-first to the forty-fifth inclusive, which commence with the second Punic War, B.C. 218, and continue the history to the conquest of Macedon, B.C. 167. There also exist brief epitomes of the lost books, as well as of those which have come down to us, which have been frequently supposed, though without sufficient reason, to have been compiled by Florus. We have however only epitomes of 140 books; but it has been satisfactorily shown by Sigonius and Drakenborch, on Livy, *Ep.* 136, that the epitomes of the 136th and 137th books have been lost, and that the epitome of the 136th book, as it is called, is in reality the epitome of the 138th. Many hopes have been entertained at various periods of recovering the lost books of Livy's original work, but they now appear to be irrevocably lost. Erpenius and others stated that there was a translation of them in Arabic; but such a translation has never been discovered. The fragments of the lost books, which have been preserved by grammarians and other writers, are given in Drakenborch's edition That portion of Roman history which was ontained in the lost books has been written in Latin by 'reinshemius with considerable diligence, and has been ublished in the Delphin and Bipont editions, together with e extant books.

We have no means for ascertaining at what time the hole of the history was completed, though there are indiations of the time in which some particular portions were ritten. In i. 19, Livy mentions the first shutting of the mple of Janus by Augustus after the battle of Actium, .c. 29; whence we may conclude that the first book was ritten between this year and B.C. 25, when it was closed a cond time. He must also have been engaged on the 9th book after B.C. 18, since the law of Augustus, 'De aritandis ordinibus,' passed in that year, is referred to in e epitome of the 59th book.

The fame of Livy appears to have been widely extended ven during his life, if we may believe a story related by 'liny (*Ep.*, ii. 3), and repeated by Jerome, that a native of 'adiz came to Rome with the sole object of seeing the reat historian. Tacitus (*Ann.*, iv. 34) and Seneca (*Suasor.*, ii.), among the later Roman writers, speak in the highest rms of the beauty of his style and the fidelity of his hisry—praises which have been constantly repeated by odern writers. But while most will be ready to admit at his style is eloquent, his narrative clear, and his powrs of description great and striking, it can scarcely be enied that he was deficient in the first and most important equisites of a faithful historian, a love of truth, diligence and are in consulting authorities, and a patient and pains-taking xamination of conflicting testimonies. His chief merits and efects as an historian have been ably drawn by Professor Ialden in his 'History of Rome' published by the Society or the Diffusion of Useful Knowledge (pp. 39-41), from rhich we extract the following remarks:—

'Livy made very little use even of such inscriptions and ublic documents as were within his reach. He appeals ndeed to the treaty of Spurius Cassius with the Latins, ngraven on a column of brass (ii. 33): but in the notable nstance of the inscription on the Spolia Opima of Cornelius Cossus, preserved in the temple of Jupiter Feretrius, which vas at variance with the received fasti (or register of magisrates) and the common accounts of historians, he does not ppear to have had the curiosity to examine the monument imself, but is content with repeating the report of Augustus Cæsar (iv. 20). This is one of the few passages in which he descends to a critical comparison of evidence and authorities; and it will serve as a proof how little expert he was in that art of an historian, and how little he valued its results: for though in this digression he professes to believe in the superior authority of the inscription, in the main course of his narrative he follows the beaten track of the writers who had gone before him. He makes no mention of other monuments which we know to have existed; the brazen column in the temple of the Aventine Diana, on which was engraven the treaty of Servius Tullius with the Latins, with the names of the tribes who were members of the league (Dion., iv. 26); the treaty of Tarquinius Superbus with Gabii, written on a bull's hide, and preserved in the temple of Dius Fidius (Dion., iv. 59); a treaty with the Sabines, of the time of the kings (Hor., *Epist.*, ii. 1, 25); the treaty with Carthage in the first year of the republic (Polyb., iii. 22) (and here his negligence is without excuse; for, even though the document itself might have perished before his time, he could have found the translation of it in Polybius, if he had consulted him before he began to narrate the Punic wars); and finally, the treaty with Porsenna, which was known to Pliny (*H. N.*, xxxiv. 14). He does not therefore found his narrative upon contemporary records, but avowedly draws his materials from the works of earlier annalists, Fabius Pictor, Calpurnius Piso, Valerius Antias, Licinius Macer, Ælius Tubero, and reposes upon their authority. As long as his guides agree in the main points of their story, he follows them without fear or doubt. When they openly contradict each other, especially on questions of names or dates, then he sometimes honestly confesses the difficulty, and acknowledges in general terms the uncertainty of the history of the first centuries of the city. But very many discrepancies less flagrant, and even some as important as those which he has specified, he passes over without notice; and yet we know with certainty that they existed, because they appear in the narrative of Dionysius, who drew from the same authorities as Livy. But though the course of his narration is sometimes checked by the conflict of external testimony, he is never induced to pause or doubt by any internal difficulty, any inconsistency or contradiction, or perplexity in the received story. Nothing less than a miracle is too strange for his acquiescence. It is evident that he has bestowed no labour upon examining the probability of the events which he relates, or investigating their connection as causes and effects.

'There are also sufficient proofs that he wrote hastily, and even carelessly. He sometimes mentions incidentally in a subsequent part of his history, circumstances which he has omitted in their proper place. Thus it is only by his remarks on the proposal for communicating the dignities of pontiff and augur to the plebeians (x. 6) that we learn from him that Ramnes, Titienses, and Luceres, were names of the antient tribes. He sometimes repeats (xxxv., 21 and 39), sometimes contradicts himself (xxx. 22, and xxxiv. 44). It is an instance and proof both of his carelessness and his want of familiarity with the antiquities of his country, that though he expressly informs us that, till a very short time before the capture of the city, the Roman way of fighting was in close phalanx with long spears, yet in no description of a battle does he allude to such tactics, and commonly uses of the older times the terms which relate to the more modern structure of the army. We cannot therefore feel assured that he always represented accurately the statements of the older annalists from whom he takes his materials.

'Any errors however which might arise from these causes would be single and detached, could bear but a very small ratio to the bulk of the history, and would not affect its general spirit. But the very tone and manner of Livy's work, however great may be his power of description, however lucid his style of narration, however much he may dazzle the imagination or interest the feelings of his readers, is a warning against implicit belief. He excelled in narration and in the eloquent expression of excited feelings, and he obviously delighted in the exercise of his genius. In reporting the traditions of the early ages of Rome, he seems less desirous to ascertain the truth than to array the popular story in the most attractive garb. He is not so much an historian as a poet. As the history advances, and the truth of facts is better ascertained, he is of course compelled to record them with greater fidelity; but still his whole work is a triumphal celebration of the heroic spirit and military glory of Rome. Here then is a disturbing force which has borne him away from the strict line of historical truth. To this desire of exalting the glory of his country (and no doubt to a similar impulse actuating those from whom he copied) we must ascribe the singular phenomena which appear on the face of the history—that in perpetual wars with the surrounding states, the Romans were never defeated in the open field (ix. 19); that when they were distressed, it was always by pestilence, or famine, or sedition; and that at such seasons their enemies abstained from attacking them; that they gained victory after victory without subduing their opponents; that taken cities re-appear in the power of their original possessors; that consuls and dictators triumph in succession over nations that are still able to supply subjects for new triumphs to new consuls and dictators; that slaughters, which must have exhausted any state of antient Italy, diminished not the number of their perpetually renovated adversaries. To this passion for extolling the military reputation of Rome we owe the comparative neglect of the less popular and less ostentatious subjects of domestic history. Every war and triumph, of which any memorial, true or false, existed, is scrupulously registered; but the original constitution of the state, the divisions of its citizens, their several rights, the contests between the orders, the constitution of the general or partial assemblies of the people, the powers of the magistrates; the laws, the jurisprudence, their progressive melioration; these are subjects on which our information is vague and scanty and ill-connected. It is evident that to the mind of Livy they possessed comparatively little interest; and that on these matters, to say the least, he did not exert himself to correct the errors or supply the defects of the writers who preceded him. He was satisfied, if from a popular commotion he could extract the materials of an eloquent speech. It is a sufficient proof that on this most important portion of Roman history he was really ignorant, that with all his powers of language he does not convey clear and vivid ideas to the minds of his readers. Who has risen from the perusal of the early books of Livy wi the distinct notion of a client or of an agrarian law?'

In addition to the history of Rome, Livy wrote several other works, which have not come down to us; amongst which Seneca (*Ep.* 100) mentions dialogues on historical and philosophical subjects; and Quintilian (*Inst. Orator.*, x. 1), a letter to his son, recommending the study of Demosthenes and Cicero.

The best editions of Livy are those by Crevier, 1735-1740; Drakenborch, 1738-1746; Ernesti, 1804; Ruperti, 1817; Döring, 1816-1824; and Kreysig, 1823-1827. His Roman History has been translated into most European languages; but we are not aware of any one which gives a faithful representation of the original work: the most esteemed are the translations in German by Wagner (1776-1782) and Cilano (1777-1779); in Italian, by Nardi (1575); in English, by Baker (1797); and in French, by Dureau de la Malle and Noel (1810-1812; and 1824).

LIVONIA (*Livland;* in German, *Liefland*), is one of the Baltic provinces of European Russia, situated between 56° 34′ and 59° 3′ N. lat., and 23° 20′ and 27° 38′ E. long. It is bounded on the north by Esthonia (or the government of Reval), on the north-east by Lake Peipus, on the east by Pskow, on the south-east by Vitepsk, on the south-west by Courland, and on the west by the Baltic, which contains the great island of Oesel, and some smaller ones belonging to this province. The area, according to Schubert, is 20,708 square miles; but other writers make it only 17,150 or 17,560 square miles. The province derives its name from its first inhabitants (the *Liven*, Livonians, a Finnish tribe), whose race is now extinct, or confounded with the Esthonians and the Lettonians (*Letten*). The surface is on the whole level and gently undulating, with here and there some hills, which rarely exceed 100 feet in height. There are no mountains properly so called: the highest ground of the whole province is the Mesenberg, near Wenden, which rises to the height of 1200 feet. Livonia is covered with vast forests, lakes, rivers, meres, marshes, and heaths. The soil on the sea-coast (which is bounded by a cliff several fathoms high) is very sandy: in the interior, sand, clay, loam, and moorland alternate; but there are also many very fertile tracts. In the east the appearance of the country is not pleasing; the better portions are in the south, especially on the banks of the Düna, where there is some very picturesque scenery. Most of the forests and marshes are in the west. The Baltic forms the great bay of Riga, between the continent and the island of Oesel. Of the lakes, 1120 in number, the most considerable are—the great lake of Peipus, united by a narrow channel with that of Pskow on the north-east; and the lake Werzierwe, 80 square miles in extent, in the centre of the province, which is connected by the Great Embach with lake Peipus. The following are smaller, viz.:—lake Burtnek, from which the river Salis issues, and runs into the Bay of Riga; lakes Marienburg, Felin, Luban, Stintsee, and others. The principal river is the Düna, which is the boundary between Livonia and Courland till it reaches Kirchholne, where it changes its direction, and empties itself at Dünamunde, below Riga, into the bay of Riga. It receives on the right side the Ewest and the Oger, and on the left the Bulleraa, which runs from Courland along the Bay of Riga and falls into the Düna near its mouth. Other smaller rivers are—the Aa, which rises in the circle of Wenden; the Salis; the Pernau, which empties itself at Pernau into the Bay of Riga; the Little Embach, which flows into lake Werzierwe which it leaves as a navigable stream under the name of the Great Embach, and runs into lake Peipus. The smaller rivers and streams are near 300 in number.

The climate is disagreeable, being cold and raw till the end of May, but very hot in the three summer months, with frequent thunder-storms. September has often some fine days, though occasionally with night frosts. On the whole the weather is very changeable and unsettled.

The chief occupation of the inhabitants is agriculture. The country produces corn, chiefly rye and barley, flax, hemp, and linseed. The fruit, such as apples, plums, and cherries, is very indifferent. There are some good horses on the estates of the nobles, but those of the peasantry are small and of little value. The horned cattle are small; sheep of the German breed are kept by the nobles; the peasants have an inferior breed, the coarse black wool of which is manufactured into cloth. Goats, swine, and domestic poultry are kept chiefly by the nobles, citizens, and clergy. There is abundance of game, white and grey hares, and especially feathered game; of beasts of prey there are bears, wolves (in large numbers), lynxes, and foxes; and of animals hunted for their fur, beavers, otters, martins, badgers, and squirrels. On the islands and sea-coast seals are taken, and fish of various kinds are abundant, especially in lake Peipus. There are no metals. Potters' clay and limestone are obtained in some parts. There are no manufactures, properly speaking, except in Riga. The country people spin yarn and thread, and make coarse cloth, linen, and wooden wares. The brandy-distilleries are numerous. The exports are corn, hemp, flax, and linseed; the imports salt, iron, lead, colonial produce, wine, manufactured goods, and articles of luxury.

The population, according to the latest accounts we can procure, is 754,000, consisting of—1st, 330,000 *Letten* in the circles of Riga and Wenden, who probably settled here at the beginning of the twelfth century, and expelled the *Liven*, or proper Livonians. They are a well-behaved, pretty industrious, and cleanly race, of Slavonian origin, speaking a peculiar Slavonian dialect, and on the whole more polished in their manners than the Esthonians. They are chiefly peasants. 2nd. *Liven*, or Livonians, now confounded with the other inhabitants, but of whom there may be 1800 in some villages in Wenden, who speak their own language, a dialect of the Finnish. 3rd. Esthonians, in the circles of Dorpat, Pernau, and Arensburg, wholly resembling their brethren in Esthonia, about 370,000. 4th. Germans and Swedes, formerly the masters of the country, and now forming the nobility, clergy, and burghers in the towns; about 45,000. 5th. Russians, 7000, and a very few Jews. Almost the whole, except the Russians, who are of the Greek church, profess the Lutheran religion. There are about 4000 Roman Catholics and 1000 Calvinists. The peasants were formerly serfs, but vassalage was abolished in 1818, and they are now nearly in the same condition as the German peasantry.

The provinces of Livonia, Esthonia, Courland, and Semgallen belonged in the earliest times to the Russian state, to which however they only paid tribute, and had their own government. The Russians did not even oppose the enterprises of foreign conquerors; thus it happened that during the distracted state of Russia they made themselves wholly independent of it, and could not be reduced to subjection till Peter the Great was able to assert his rights to these provinces. Livonia was almost unknown to the rest of Europe till 1158, when some traders from Bremen, in search of a new commercial intercourse with the north, were driven, on their voyage to Wisby in Gothland, upon the coast of Livonia. The people of Bremen now visited the country more and more frequently for the purposes of trade, and even formed settlements in it. In 1186 Meinhard, an Augustine monk, with other Germans, settled in Livonia and having converted the natives to Christianity, became the first bishop. But Albrecht, the third bishop, who came with a new company of adherents to the Düna, was the first who was able to estabilsh his spiritual authority on a secure foundation. He built in the year 1200 the town of Riga, and fixed his see there.

Towards the end of the century Canute VI., king of Denmark, made himself master of these provinces, which Waldemar III., one of his successors, ceded for a sum of money to the Teutonic order, which was united with the Order of the Knights Sword-bearers, founded in 1201 by bishop Albrecht, so that the Teutonic Knights remained in possession of the four provinces. At length the weakness of the Order, which was unable to resist the czar Ivan II., Wasiljewitsch, who sought to recover those provinces that had been detached from the Russian empire, caused the entire dissolution of the whole state. Esthonia placed itself under the protection of Sweden; Livonia was united with Poland; Courland and Semgallen became a duchy under Poland, which Gotthard Kettler, the last grand-master of the Teutonic order, obtained as a fief under that crown. From that time Livonia became the apple of discord for which Sweden, Russia, and Poland disputed for a century (1561 to 1660). By the treaty of Oliva, in 1660, Poland ceded those provinces to Sweden, and they were united with Esthonia. By the treaty of Nystadt, in 1721, both were annexed to the Russian empire.

Livonia is divided into five circles, those of Riga, Dorpat, Arensberg, Pernau, and Wenden.

(De Bray, *Essai sur l'Histoire de la Livonie*, 3 vols., Dorpat, 1817; Hassel, *Erdbeschreibung*, &c.)

LIVO'NECA. [Isopoda, vol. xiii., p. 52.]

LIVORNO, called by corruption Leghorn by the Engsh, and Livourne by the French, is a seaport town on the 'est coast of Italy, in the grand-duchy of Tuscany. It :ands at the southern extremity of a low and partly marshy lain, which extends from the left bank of the Arno to the ills of Montenero, which are a projection of the ridge hich runs by Volterra, and divides the basin of the Arno 'om that of the Ombrone or Maremma of Siena. The ills of Montenero end abruptly on the sea about three iiles south of Livorno: they are naturally stony and barm, but the slope towards Livorno is covered with countryouses and gardens, which are the resort of the merchants nd their families during the summer, and have a fine seaiew, which embraces the coast and the Apennines to the orth towards the Gulf of La Spezia, the islands of Gorona, Capraia, and Elba, and the mountains of Capo Corso, r the northern extremity of the island of Corsica. Livorno ; 14 miles south by west of Pisa, and 45 west by south of 'lorence, in 43° 33′ N. lat. and 10° 19′ E. long.

The town is neatly and regularly built; the streets are 'ide and mostly straight, and there is a fine square in the iiddle of the town. The western district, called la Nova 'enezia, is intersected with canals, by which the goods are irried in boats from the shipping in the harbour and landed efore the warehouses of the merchants. Many of the priate houses are handsome, uniting Italian outward archiecture with interior comfort. The shops are well supplied ith goods, and fitted up in good taste. Of all the towns . the Mediterranean perhaps Livorno most resembles an nglish town; the inhabitants are, by long intercourse, miliar with the English, and well disposed towards them, id the English language is spoken, or at least understood, / many of the natives. The people are active, steady, and :aceably inclined. A greater tolerance exists here than in iy other part of Italy: the English and Lutherans have iapels and burying-grounds, the Greeks a church, and the :ws a very handsome synagogue. The English buryingound, situated on the ramparts, is adorned with numerous arble monuments—among others that of Smollett, who ed here. The town itself is little more than two miles in rcumference; but two large suburbs, one beyond the north · Pisa gate, and the other to the south, called Borgo Capiccini, have gradually increased to the size of towns, and ive been lately included within the boundaries of the orto Franco, wherein goods can be landed and warehoused, id exported again without paying duty. The outer mole, hich is more than a mile in length, and joins the lightouse, affords a pleasant walk. The harbour is tolerably rge, but not sufficiently deep for large vessels, which lie . the roads, where the anchorage is safe and good. The arsena, or interior harbour or dock, is only fit for smaller :ssels. Near the Darsena is a fine colossal statue of Fernand I., the benefactor of Livorno. The lazzarettos, of hich there are three, outside of the town and on the seaiore, are remarkable for their excellent distribution and :rfect security, being surrounded by wet ditches, and furished with extensive warehouses and convenient lodgings.

Livorno is entirely a commercial place: it has however a isino, or assembly-house, a theatre, very good inns and iffee-houses, and the vicinity of Pisa affords the opportunity r a pleasant drive and an interesting excursion. Elementry schools and infant schools have been of late years estaished at Livorno; and the Jews, who are about 15,000 in imber, and many of whom are descended from Spanish id Portuguese Jews expelled from the Peninsula two cenries since, vie with the Christians in promoting popular lucation. The population of Leghorn is now reckoned at ,000, among whom are individuals of every nation in Eupe, besides Turks, Moors, Armenians, and Jews from frica and Asia.

Livorno has no claim to classical antiquity; it is first menined as a village, parish, and fort, adjacent to Porto isano, or the harbour of Pisa, in the eleventh century. It as ravaged in the wars between Genoa and Pisa, was taken issession of by the Visconti of Milan, and afterwards by ie French General Boucicault, who sold it in 1407 to the enoese for 26,000 golden ducats. Pisa and its port had llen at that time into the hands of the Florentines, who it long after effected the purchase of Livorno from the epublic of Genoa, in 1421, for 100,000 golden florins. The lorentines established docks at Livorno, where they built ieir vessels, and surrounded the place with walls. As the :ighbouring Porto Pisano became gradually filled up by ie simultaneous effects of the alluvial deposits of the Arno and other streams, and by the sand thrown up by the western storms, the importance of Livorno as a port increased in proportion, until at last it entirely obliterated the former. But the great increase of Livorno took place in the following century, under the dynasty of the Medici. The grand-duke Cosmo I. granted to all new settlers privileges and immunities from taxes, and security from pursuit in consequence of debts contracted or penalties incurred in other countries. He also built a mole and light-house, and made it the station of the galleys of the military order of St. Stefano, whose avocation, like that of the order of St. John of Jerusalem, was to cruise against the Mussulmans. His successor Ferdinand I. greatly extended the improvements begun by Cosmo; he raised regular fortifications round the town, built warehouses, a fortress, a lazzaretto, and numerous other buildings, and excavated a navigable canal communicating with the Arno. He not only confirmed the privileges and immunities to new settlers granted by Cosmo, but he published an indulto in forty-eight articles, dated the 10th of June, 1593, by which merchants of all nations and of every religion, Greeks, Armenians, Turks, Jews, Moors, and others, were invited to come and settle at Livorno, without fear of being molested on account of their religion, and with full security for their persons and property. It happened that about this time the fanatical intolerance of the Spaniards was driving away the Jews and Moors from the Peninsula, and several thousand Jews availed themselves of the asylum thus offered to them by Ferdinand. A number of Corsicans, dissatisfied with their Genoese rulers, and of Provençals, scared away by the civil wars which desolated France, came also to settle at Livorno. Cosmo II. continued to favour Livorno, and gave it municipal statutes, built new ships of war, and when the edict of Valencia, in September, 1609, by Philip III., banished all the remaining Moors from Spain, Cosmo invited 3000 of those exiles to settle as colonists in the territory round Livorno. But the insubordination and fierceness of those strangers obliged the grand-duke some time after to embark them for the coast of Africa. Livorno has continued ever since to prosper through the enlightened protection of the successive grand-dukes and the tranquillity which Tuscany has in general enjoyed. During the first years of the war of the French Revolution, the neutrality adopted by the grand-duke Ferdinand, whilst all the rest of Europe was at war, favoured greatly the commerce of Leghorn. When Bonaparte however invaded Italy in 1796, he did not respect the neutrality of Tuscany, but sent a body of troops to seize upon all English, Portuguese, Neapolitan, and Austrian property at Leghorn, and even insisted that the merchants of Leghorn should deliver the balances and deposits which they had in their hands belonging to individuals of the above nations, an act of bad faith which the merchants honourably avoided by subscribing a round sum, which they paid to the French. After the rupture of the peace of Amiens, Livorno enjoyed a kind of neutrality under Maria Louisa of Spain till 1808, when Napoleon occupied Tuscany and annexed it to the French empire. Upon this, the trade of Livorno was annihilated, its counting-houses gradually became deserted, a ship seldom entered the harbour, many of the merchants wound up their accounts, and retired to Pisa and other places. Livorno was one of the ports which suffered most from the Continental system, and in which the dominion of Napoleon was most disliked. With the peace of 1814 the prosperity of Livorno returned, and it has made rapid strides ever since. Population and buildings have rapidly increased. The immunities of the Porto Franco have been extended to the suburbs, an aqueduct has been constructed, and other improvements have been effected. A railroad is now in progress between Livorno and Florence. A capital of thirty millions of Tuscan livres (one million sterling) has been raised by shares of 1000 livres each for the purpose. The length of the road will be about 50 miles.

The imports into Livorno are either for consumption or for deposit. In the first place, Livorno supplies with foreign goods Tuscany, Lucca, part of the Roman States, and partly also Modena and Parma. In the last century it used to supply Lombardy also, but Trieste has now supplanted Livorno in this branch of trade. The deposit trade of Livorno was also in the last century more extensive than it is now. The English, Dutch, American, and other ships from the Atlantic carried thither manufactures and colonial goods, and exchanged them for cotton, silk, and other produce of the Levant, which were brought to Livorno by Italian [illegible]

Greek vessels. The facilities afforded by the lazzarettos and warehouses, the perfect freedom of trade, and the security enjoyed there, made Livorno a most convenient place of exchange between the Levant and the nations of western Europe. This relation of things is now materially altered. Commerce is become more direct: the English, American, and other vessels from the west proceed straight to the Levant and the Black Sea to exchange their cargoes, and the improvements that have taken place in Turkey of late years, and the security afforded to navigation by the state of general peace, all tend to favour the direct intercourse between consumer and producer, and to diminish the importance of ports of deposit, such as Livorno, Malta, Lisbon, &c. Still the transit trade of Livorno is considerable; its warehouses are always well supplied, and it is a convenient place especially for the smaller vessels from the coasts of Italy and its islands to take in their cargoes.

The principal articles of produce of the country exported from Livorno are: silk, either in thread or manufactured, to the amount of about three millions of francs annually; oil, two millions; straw hats, three or four millions—formerly this article amounted to seven millions of francs; iron from Elba, paper, potash, alabaster, coarse woollen cloths for the Levant, coral gathered on the coasts of Barbary and Sardinia, and manufactured at Livorno; and anchovies, which are fished off the island of Gorgona, opposite Livorno. The chief imports are: corn from the Black Sea, French woollens, English cotton goods, hardware, salt fish, and colonial articles. In 1832 the imports amounted to sixty-eight millions of francs, and the exports about fifty millions. In the same year there entered the port of Livorno 199 English vessels, 126 Austrian, 75 Russian chiefly from the Black Sea, 61 American, 30 Swedish, 9 Danish, 4 Dutch, 61 Greek, besides more than 2000 coasting vessels from the coasts of Italy, France, and Spain.

(Serristori, *Saggio Statistico;* Magri e Santelli, *Stato antico e moderno di Livorno,* 3 vols. 1772.)

LIVRE, antiently a money of account in France, afterwards a coin. The word is derived from the Roman *libra,* or pound, the standard by which the French money was regulated, twenty sous being made equal to the livre, or libra. Kelly, in his 'Complete Cambist,' vol. i., p. 141, says, 'Accounts are kept in France in francs of ten decimes, or a hundred centimes. Before the year 1795 they were kept in livres of 20 sous or 240 deniers. The livre and franc were formerly of the same value, but the franc is now 1¼ per cent. better; thus 80 francs equal 81 livres, and by this proportion the antient monies have been generally converted into modern. By a decree of 1810 the following proportion was established: pieces of 48 livres, at 47 fr. 20 centimes; pieces of 24 livres, at 23 fr. 55 centimes; of 6 livres, at 5 fr. 80 centimes; of 3 livres, at 2 fr. 75 centimes.

The livre was formerly of two kinds, Tournois and Parisis. The *Livre Tournois* contained 20 sous Tournois, and each sol or sous 12 deniers Tournois. The *Livre Parisis* was of 20 sous Parisis, each sous worth 12 deniers Parisis, or 15 deniers Tournois; so that a livre Parisis was equivalent to 25 sous Tournois; the word Parisis being used in opposition to Tournois on account of the rate of money, which was one-fourth higher at Paris than at Tours.

In the money of the Mauritius, or Isle of France, colonial livres are used, two of which equal a franc.

Kelly, *ut supra,* vol. i., p. 269, says, under 'Neufchatel in Switzerland,' there are different modes of keeping accounts here. The most antient method is in *Livres foibles,* of 12 gros or 144 deniers, which is partially retained, particularly in rents and inferior departments of business. The second way of keeping accounts is in livres Tournois of Neufchatel, divided into 12 sous or 240 deniers, one livre of which equals 2½ livres foibles, and is worth 13½*d.* sterling money. Another mode was introduced in 1798, which is in franken of 10 batzen, or 100 rappen.

The *Lira Italiana* is the Italian livre; equal to the French franc, with its divisions and multiples in proportion. There is also the lira of Modena, and the lira of Reggio; the former worth 3¾*d.* sterling, the latter worth only two-thirds of the lira of Modena.

Accounts are likewise kept in several parts of Canada in livres according to the antient system of France. (Kelly, vol. i., p. 59; ii., 293.) This is called old currency.

LIXI'VIUM, a term which is synonymous with *ley.* It was used by the older chemists to signify a solution of an alkali in water; and what is now usually called an alkaline solution, or a solution of an alkali, was termed indifferently an alkaline ley or alkaline lixivium.

LIZARD. [LACERTIADÆ; SAURIANS.]

LIZARD POINT. [CORNWALL.]

LJUNGAN-ELF. [ANGERMANLAND.]

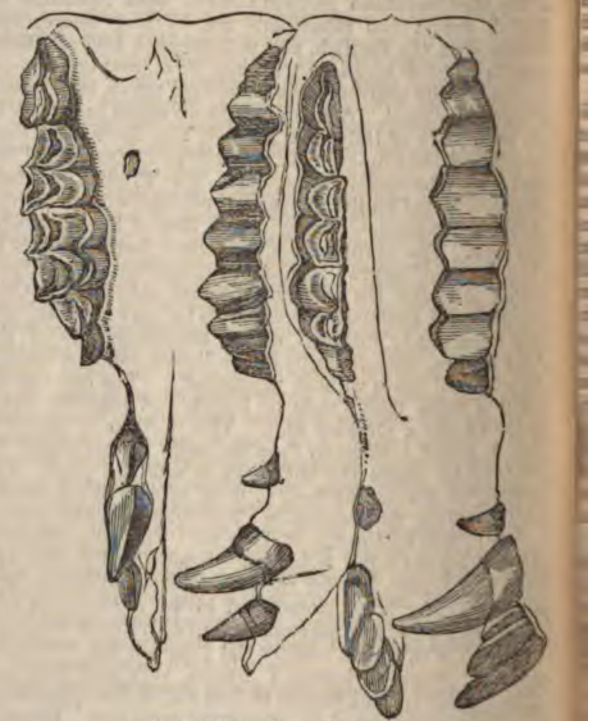
LJUSNAN-ELF. [SWEDEN.]

LLAMA (*Auchenia* of Illiger; *Lama* of Cuvier and others), the generic name for that form of the *Camelidæ* which is confined to the New World.

ORGANIZATION.

Dentition:—Incisors $\frac{2}{6}$, Canine $\frac{1-1}{1-1}$, Molars $\frac{5-5}{4-4}$ = 30.

The difference between the dentition of the two sub-families of *Camelidæ, Camelus* and *Auchenia,* appears to consist mainly in the absence of the two small pointed teeth, which are found in the interval or 'bar' between the canines and the molars in the *Camels,* from the jaws of the *Llamas.* Thus the *Llamas* have four false molars, as they may be termed, less than the *Camels.* In other respects the dentition of the one is, as nearly as may be, the dentition of the other. The following cut exhibits the dental arrangement of the *Dromedary,* and will convey a sufficiently accurate idea of the same parts in the Llamas, if the spectator will suppose the absence of the four teeth above-mentioned. The difference was considered by M. F. Cuvier to be of such small importance, that he has not considered it necessary to give a figure of the dentition of *Auchenia.*



Teeth of Dromedary. (F. Cuvier.)

Baron Cuvier observes, that the *Camels* and *Llamas* differ in many points from the horned ruminants. Considered as a whole, the head of the former presents a narrower and more lengthened muzzle (un museau plus aminci), a cranium larger in proportion, orbits placed more forward, and the edges of those orbits more prominent, in consequence of the temples being more sunk.

In the *Llama* the bones of the nose are short, and their extremity notched; their base is slightly enlarged; the lacrymal bone is but little advanced upon the cheek, and leaves a wide space between its anterior angle and the upper external angle of the nasal bone. It does not cover the orbitary part of the maxillary bone, but stops above the suborbital internal hole; nothing of the vomer is to be seen above the spheno-palatine hole, and a small portion of the pterygoïd internal apophysis scarcely shows itself there. The parietal bones are soon united into a single bone much wider than it is long; the posterior suture of which remains, nevertheless, before the occipital crest. The temporal wing of the posterior sphenoid bone has a descending prominence, and its pterygoid wing terminates in a sharp point, which projects more than that of the pterygoid apophysis. The tympanic bones are compressed, but project very much: the occipital crest is well marked.

The true *Camels*, according to the same author, have the occipital crest still more marked and the temples still more sunken than they are in the *Llamas*, and almost as much as they are in the *Carnassiers*. The occipito-temporal suture is very much in front of this crest. The bones of the nose are of much less width at their bases, and there is a great space between the small membranous portion which exists at their angle and the lacrymal bone, which is extremely small on the cheek; it does not reach in the orbit even to the edge of the suborbital internal hole. There is, as in the *Llama*, a small membranous space between the lacrymal, frontal, and palatine bones, which advances to that spot by a small tongue-shaped portion. The wing of the vomer shows a small portion above the analogous hole of the spheno-palatine bones. The internal pterygoid apophysis does not exist except towards the point of the wing: it does not rise till it reaches the body of the sphenoid bone, and there is no space between the wing of that bone and the wing of the palatine bone.

In all other respects, as regards the head, the *Camels* and *Llamas* offer a singular resemblance. The sockets of the incisors are smaller than in other ruminants, and the canal analagous to the pterygo-palatine terminates in the palate by more numerous holes. The oval hole is smaller.. Internally the floor (plancher) of the cerebral cavity is much more united than it is in the *Deer* and the *Sheep;* the clinoid posterior apophyses form together only one small plate; and the region where the optic nerves are lodged is nearly on a level with that of the pituitary gland.

The anterior teeth of the *Camels* exhibit a considerable difference from those of the other ruminants: they have, in the first place, both above and below, the first molar, or rather false molar, detached from the others, and situated forwards, as we have seen above; and which, from its isolated position and pointed form, puts on the appearance of a canine tooth. They have moreover a true canine tooth implanted at the anterior border of the maxillary bone. This tooth becomes in aged subjects developed like the canine of one of the great *Carnassiers*. Lastly they have a true upper incisive tooth implanted in the intermaxillary bone, and this also puts on the form of a canine tooth: thus the *Camels seem* to have in the upper jaw three canines on each side. In the lower jaw they have only the eight ordinary incisors; but besides that the detached molar performs the office of a canine tooth, the external incisor has a pointed form, and rises to interlock (s'engrener) between the upper canine and incisor: this then again represents a canine tooth, and in the old camel it has the entire appearance of a strong canine of a *Carnassier*.

'In the *Llamas*,' continues Cuvier, 'whilst they have, like the *Camels*, only five molars in a series, and often even only four below, I do not find the detached anterior molar, or at least I must think that it falls very early; but the upper canine and incisor, and the external incisor below, are disposed as in the Camels, and are only more compressed and trenchant at their edges. In both these subgenera the lower incisors are large, strong, a little unequal, and directed forwards.'

The metatarsal and metacarpal bones of the *Camels* and *Llamas* are easily recognised, because they are divided higher than in the other ruminants and well above the articular pulleys. In the *Camels* the scaphoid and cuboid bones of the tarsus are not soldered, and always remain distinct. The two edges of the rotatory pulley (poulie rotulienne) of the *femur* are in the *Camel* nearly equal, as in the *Hog*. In the ruminants generally the ulna is scarcely more than an appendage to the radius, but the distinction generally remains marked throughout the length of the bones, though they become soldered by age, as in the *Ox*, *Deer*, *Sheep*, and *Gazelles:* in other cases the ulna disappears soon after passing the olecranon, as in the *Giraffe*, and still more in the *Camel*. In the *Camels* and the *Llamas* the tuberosities of the upper head of the humerus are not elevated as in the other ruminants. With regard to the pelvis, the *Camel* has the external angle of the ischium pointed and without truncation, and the spinal angle large and rounded; but this last is as much and more advanced than the other. The posterior front of the pelvis is enlarged, and its posterior border much more like that of the horse; and so it is in the *Llama*. (*Ossemens Fossiles*.)

Professor Owen has detected an osteological character, not noticed by Cuvier, which peculiarly marks the *Camelidæ*, viz. the absence of the perforations in the transverse processes of the cervical vertebræ for the transmission of the vertebral arteries.

In the structure of the stomach, the *Camelidæ* exhibit a marked difference from other ruminants. This part of the organization in the true Camels is explained in the article CAMEL; and though doubts have been thrown on the fact, the stomach of the *Llama* is formed upon the same peculiar principle as that which governs the development of this viscus in the *Camel*. Sir Everard Home maintains that, though a portion of the stomach of the *Llama* is, as it were, intended to resemble the reservoirs for water in the *Camel*, these have no depth, are only superficial cells, and have no muscular apparatus to close their mouths and allow the solid food to pass into the fourth cavity, or truly digesting stomach, without going into these cells. Dr. Knox, on the contrary, has shown that the real differences between the stomachs of the *Llama* and *Camel* are much less than had been imagined. The truth is, that in making observations on parts of this description, a great deal depends upon the care taken to keep the body of the subject in a fixed position. Thus we find Mr. Spooner, on the occasion of his reading his notes on the *post mortem* examination of a *Dromedary* that died in the Garden of the Zoological Society, observing that though he found nothing to add to the accounts already given by Daubenton and Sir E. Home, the cells of the first cavity in the subject on which he was reading contained food; and he was therefore induced to suggest that doubts might be entertained of the correctness of the generally received opinion, that these sacs are destined to act as reservoirs for fluids.

Upon this, Mr. Owen stated that he also had found in the cells of the stomachs of *Llamas* which he had dissected more or less of food; but he suggested the probability that this might have been forced into them by moving the animal about after death, when, muscular power being abolished, resistance to the admission of the food into the cells would have ceased. He added, that in the instance of the *Camel* which was killed some years since at the Royal College of Surgeons (the particulars of the examination of which have been published by Sir E. Home), the cells of the second and first cavities of the stomach were found to be filled with water only: in that case the animal had been kept without drink for three days, was then allowed to drink freely, was killed three hours afterwards, and was opened without being moved from its erect position. Mr. Cox, on the same occasion, suggested that the existence of food in the cells in the instances referred to might perhaps be accounted for by the fact that the animals in question had been kept for many years in this country, where they were at all times provided with water: under these circumstances a receptacle for the preservation of fluid would not be called into use; and the cells having therefore ceased to be applied to that purpose, the muscular power of their apertures would have been consequently diminished. Colonel Sykes added, that on examining, in India, the stomach of a *Camel*, he had found the cells devoid of food. (*Zool. Proc.*, 1832.) Professor Owen informs us that the *Camel* killed at the College of Surgeons had been a long time in England; but the function of the water-cells was not altered, as the experiment clearly proved.

The student, if he be disposed to doubt at all, will have his doubts on this point cleared up by an examination of the parts in the Museum of the Royal College of Surgeons, prepared by Professor Owen; and, as this part of the subject is peculiarly interesting, we proceed to give a description from the pen of that gentleman of the preparations there preserved. No. 566 B (Physiological Series), is the stomach of a fœtal Llama (*Auchenia Glama*, Desmarest). This singular form of ruminating stomach, observes Mr. Owen, is peculiar to the Camel tribe; it is in some respects simpler than that of the horned ruminants, and in others more complicated. Like the stomach of the small species of Moschus (No. 554), the psalterium is less distinctly separated from the abomasus, and at this early period of existence it exhibits in the Llama a similar deficiency of the characteristic laminæ. The reticulum however is much more complex, each of the larger alveolæ being developed into many smaller ones, a structure partially indicated in the reticulum of the Goat (No. 564), and more strongly marked in that of the Ox (No. 464 A). There are moreover two groups of cells developed from the rumen, which differ from those of the reticulum in being shallower, and being visible from without, giving a sacculated character to those parts of the paunch. The several compartments of the stomach have been laid open in this preparation to show their communications with each other and the character of their inner surface. The rumen is lined with cuticle, but is wholly destitute of the villi which characterize it in the horned ruminants. It is partially divided into two compartments by a strong fasciculus of muscular fibres, which, commencing on the left side of the cardiac orifice, traverses the paunch longitudinally. On the right side of this ridge, about fourteen smaller muscular fasciculi pass off at right angles, and these ridges are connected by still smaller fasciculi, running transversely between them at different distances from each other; the quadrangular spaces which result from the above arrangement of fasciculi are partly closed by a production of the lining membrane, leaving a circular aperture in the centre of each square for the passage of liquids into the cells beneath. The compartment of the paunch to the left of the great longitudinal ridge terminates in two sacculi, at what may be considered the cardiac extremity. The sacculus nearest the œsophagus is simple; the one farthest from it is developed into a series of cells, of a smaller size but of precisely similar construction to those on the opposite side of the paunch—a series of smaller muscular bands passing off at right angles from the larger one, which separates the two sacculi, and these lesser bands being connected by transverse fasciculi, in the intervals of which the cells are developed. The reticulum, or water-bag, is laid open, showing that the cells are situated between a series of parallel muscular fasciculi, as in the rumen; but their further subdivision is carried to a greater extent, and their orifices are not guarded by membranous productions. The external muscular coat of this cavity is so disposed that its exterior is smooth and uniform, and the cells are scarcely visible from without. The œsophagus is laid open, so as to show the muscular ridge which traverses it longitudinally, and winds round the upper part of the reticulum to terminate at the orifice of the psalterium. 'It is obvious,' continues Mr. Owen, 'that by the contraction of this fasciculus, all communication between the first two cavities and the œsophagus would be cut off, and the remasticated food would be conducted, as in the horned ruminants, into the third cavity. A slighter degree of contraction would cut off the communication with the rumen, and allow the passage of fluids direct into the reticulum or water-bag, which probably takes place when the Camel or Llama drinks. A free communication however subsists between the water-bag and paunch. A porcupine's quill is passed through the oblique canal leading to the third cavity; this cavity in the Camel is a small sacculus, distinct from and intervening between the reticulum and psalterium; it is not so distinct in the Llama; but on a close inspection, the inner membrane nearest the orifice above mentioned may be seen to be produced into ridges, which are arranged in a reticulate or alveolar form; and as a similar structure is more distinctly observable in the Camel, this cavity was considered by Daubenton as the true analogue of the reticulum, and the water-bag as a peculiar super-addition. The remainder of the stomach in the fœtal Llama may be seen to form one elongated continuous cavity, bent upon itself at its lower third without rugæ or laminæ, the latter being afterwards developed at the cardiac half of this cavity. The pylorus is a small transverse aperture protected by a large oval protuberance. The duodenum is considerably dilated at its commencement. No. 566 C exhibits a small portion of the stomach of an adult Llama, showing the canal which passes along the upper part of the reticulum, and conducts the ruminated food from the œsophagus to the third cavity. The muscular fibres of the greater ridge, forming the upper boundary of this canal, are displayed: some of the fibres wind round the aperture of the third cavity, while others return and pass into the lesser ridge. It is these latter fibres, observes Mr. Owen, which, by a forcible contraction, draw up the orifice of the third cavity towards the cardia, and close the communication between the œsophagus and water-bag. The commencement of the reticulum, analogous to the third or supernumerary cavity in the Camel, is kept distended by a bristle. No. 566 D is a portion of the greater group of cells from the paunch of an adult Llama. The cuticle which lines these cells is turned down, and the subjacent membrane removed, to show the muscular fibres of the larger fasciculi, and also those of the lesser connecting bands, which are *distinctly muscular*, and evidently calculated to close the orifices of the cells.' Mr. Owen further observes that, after death, when these contractile parts have ceased to act, the smaller matters contained in the paunch, such as grains of oats, &c., may pass into these cells; but their contents he always found to be chiefly fluid. No. 566 E is the reticulum, second cavity, or true water-bag of the Llama. This cavity, Mr. Owen remarks, is not lined with cuticle, as in the horned ruminants; the other differences are pointed out in the description of the following preparation.[*] The muscular fibres of two of the larger ridges have been dissected; they form by no means such powerful fasciculi as in the corresponding ridges of the paunch-cells. The middle fibres in each ridge become tendinous; but the lateral fibres continue muscular, and pass off to the different connecting ridges, from which they spread over the entire circumference of the cells, and constitute the second or internal muscular tunic of this part of the stomach. On the opposite side of the preparation a portion of the external layer of fibres is exhibited. (*Catalogue*, vol. i.)

We here see that the structure in this very essential part of the organization is similar in both the forms of the *Camelidæ*, and that the Llamas of the New World, as well as the Camels of the Old World, are provided with the means of preserving fluids in cells appropriated to that office. Such a provision is consistent with the localities and habits of both; for if the parched deserts wherein the lot of the Camel is cast require such a modification of the stomach, the Llama, whose stronghold is the mountain-chain that traverses the southern parts of America, and which is found high up on the Andes, often out of the reach of lakes, requires little less.

Mr. Owen, in his interesting paper 'On the Anatomy of the Nubian Giraffe,' states that the action of the abdominal parietes in rumination is much stronger in the Camel than in the Giraffe; and he observes that it is a singular fact, and one which has not hitherto been noticed, that the *Cameline Ruminants* differ from the *true Ruminants* in the mode in which the cud is chewed. In the *Camels* it is ground alternately in opposite directions from side to side: in the *Oxen*, *Sheep*, *Antelopes*, and *Deer*, the lower jaw is ground against the upper in the same direction, by a rotatory motion. The movements may be successively from right to left, or from left to right, but they are never alternate throughout the masticatory process, as in the *Camels*: and here again, he remarks, in the rotatory motion of the jaws of the *Giraffe*, while masticating the cud, we have evidence of its affinity to the horned ruminants. (*Zool. Trans.*, vol. ii. Communicated Jan. 1838.)

With regard to external characters, we have, both in the Llamas and the Camels, the long neck and comparatively small head, and the prolonged moveable upper lip, deeply fissured vertically; we miss, in both, the naked muzzle, and find the apertures of the nostrils mere fissures capable of being shut at pleasure. The differences in the dentition have been already noticed; and though we look in vain for the humps of the true Camels on the backs of the Llamas, yet there is, according to Molina, a conformation in the latter resembling that excrescence, and consisting of an excess of nutritious matter, in the shape of a thick coat of fat under the skin, which is absorbed as a compensation for occasional want of food. The most marked difference appears to exist in the structure of the feet; and this difference is, as we shall presently see, demanded by the several localities and habits of the two groups. No structure can be imagined more admirably contrived for the support and passage of an animal over arid sands than the elastic pad which forms the sole of the Camel's foot, and on which the conjoined toes rest.

But the problem to be solved was the adaptation, in an animal of generally similar structure, of a foot to the exigencies of the case. The pad which connects the toes of the *Camel* beneath would have afforded no very sure footing to an animal destined to climb the precipices of the Andes; and we accordingly find, in the *Llama*, toes with strong and curved nails, completely separated from each other, and each defended by its own pad or cushion, so as to present the most perfect modification of the parts with a view to firm progression, either in ascent or descent, whilst there is

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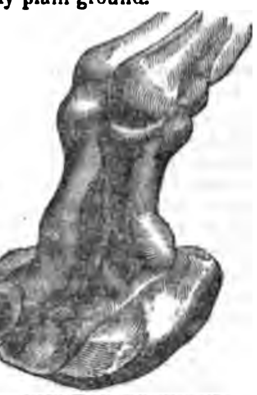
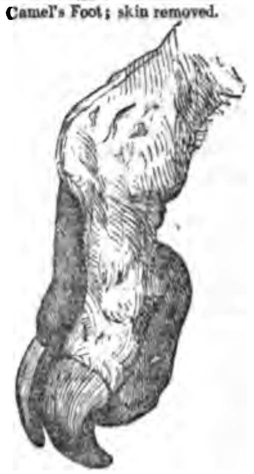
[*] No. 567, a portion of the reticulum, or water-bag, of a Camel, injected and showing more distinctly the nature of its lining membrane, and that the inner surface of this cavity is a secreting and absorbing surface. This membrane has been removed from one of the greater and from some of the lesser bands, showing the muscularity of these parts, and that none of the fibres become tendinous, as in the Llama, in the larger bands. (*Cat.*) See, further, CAMEL, vol. vi., p. 189.

in the structure calculated to impede great rapidity
mparatively plain ground.



Camel's Foot; skin removed.



Foot of Llama; with the skin on.

NATURAL HISTORY.

derable doubt is still entertained as to the number
ss belonging to the genus *Auchenia*, and we shall
ur to trace some of the accounts given, beginning
ne of the earlier historians and zoologists, and con-
the inquiry down to the present time.

Spaniards, when they conquered South America,
ıe Llama, which seems to have been the only beast
ıen possessed by the natives, to whom it likewise
d and raiment; for the flesh was eaten by them,
hair or wool was woven into cloth. We cannot be
d that so useful an animal should have been called
onquerors a sheep, especially when we recollect the
of its flesh and of its wool; and accordingly we
Llamas described as sheep by the earlier Spanish
Thus, Augustin de Zarate, treasurer-general in
1544, in his account of the conquest, speaks of the
as it was observed in the mountains of Chili, as a
f burthen. He says that in situations where there
ow, the natives, to supply the want of water, fill the
f sheep with that fluid, and make other living
arry the skins; for he remarks that these Peru-
eep are large enough to serve as beasts of bur-
De Zarate evidently had the eye of a zoologist,
ays that these sheep resemble the camel in shape,
they have no hump. He states that they can
out a hundred pounds or more, that the Spaniards
ride them, and that their rate of travelling was
five leagues a-day. His description appears to
of an eye-witness, and bears upon it the impress of
When they are tired, says De Zarate, they lie down,
load must be taken off, for neither beating nor help
e them get up. Their weariness is manifested in a
agreeable way when a man is on one of them; for
or says that if the beast is pressed on under such
tances, it turns its head and discharges its saliva,
as a bad odour, into its rider's face. He speaks of
of great utility and profit to their masters, praises
od and fine wool, particularly that of the species
acas, which have very long fleeces, and shows that
p costs little or nothing, either in money or trouble;
are satisfied with a handful of maize, and are able to go for four or five days without water. He declares that their flesh is as well-flavoured as that of a fat Castilian sheep, and notices the public shambles for the sale of it in all parts of Peru then frequented by these animals. But, he remarks, this was not the case on the first arrival of the Spaniards; for when an Indian killed a sheep at that time, his neighbours came for what they wanted, and then another Indian would kill a sheep in his turn.

The Llama soon found its way to Europe; for we find, in the 'Icones Animalium' (Gesner, &c.), a figure of one with a collar round his neck, led by a man, apparently his keeper. This figure is by no means badly executed, and is given as the *Allocamelus* of Scaliger, who speaks of it as an animal 'in terra Gigantum' (Patagonia probably), with the head, the ears, and the neck of a mule, the body of a camel, and the tail of a horse: 'Quamobrem ex Camelo et aliis compositum 'Αλλοκάμηλον appellavimus.' The figure, it appears, was taken from a print, with the following account:—'In the year of our Lord 1558, on the 19th day of June, this wonderful animal was brought to Middleburgh (Mittelburgum Selandiæ), having never before been seen by the princes of Germany, nor recorded by Pliny nor other antient writers. They said it was an Indian Sheep from Piro (perhaps Peru), a region nearly six thousand miles distant from Antwerp.' Then follows the description, from which it may be gathered that the animal was either a brown Llama or a pied one. The neck is stated to have been very white, 'cygneo colore candidissimum,' and the body rufous, 'rufum aut puniceum.'

John de Laet (fol., Leyden, 1633) appears to have collected most of the Spanish authorities up to his time. He quotes Garcilaso as saying that the domestic animals of the Peruvians are of two kinds, the greater and the less; which the Peruvians, as a common name, call *Llama*, that is, cattle or sheep (pecudes); thus the shepherds say *Llama michec.* They call the greater cattle (majus pecus) *Huanacu-llama*, on account of its similitude to the wild animal which is named *Huanacu*, and from which it differs in colour only; for the domestic Llamas (domesticum pecus) are found of various colours, like the horse; but the wild Llama is only of one colour, like chestnut. The greater kind have a great resemblance to a camel, except that they want the hump, and are not so large. The small kind (minus pecus) they call *Paco-llama*, and this is only fed for its flesh and its wool, which is the best and longest, as it is unequal to the carrying of burthens.

De Laet then turns to Acosta. 'Peru,' says the latter, 'has nothing better or more useful than its cattle, which our countrymen call Peruvian sheep, but which the Peruvians, in their tongue, name *Llama;* for they bring large profit, and are kept for next to nothing (vilissimo alitur). These cattle furnish the natives with wool for their vestments, like our sheep, and are used by them as beasts of burthen. There is no necessity for shoeing them, guiding them by a rein, or feeding them with oats; for these animals serve their master gratuitously, being content with the wild herbs which they meet with everywhere. There are two kinds (species)—one which is woolly and called *Paco* by the natives, the other covered with a slight fleece (villis levibus) only, and nearly naked, whence it is more fitted for carrying burthens, called *Guanaco.* They are rather larger than sheep, but less than heifers, with a long neck like the camels, lofty legs, and a compact body: the colour is various, for some are white, some black, some brown, and some piebald (versicolores), which they call *Moromori.* Their flesh is good, although rather gross (spissior), but that of the lambs is much the best and the most delicate; but they are rarely killed, because they are of by far greater use as beasts of burthen, and their wool serves for making cloth. This wool the barbarians clean, spin, and weave into garments; but it is of two sorts, one coarser and more common, which they call *Havasca*, the other finer and more loose (absolutior), which they call *Cumbi* (according to Garcilaso, *Compi*): from this last they weave various curtains and hangings (aulea et peristromata) of most elegant workmanship, which last a long time, and in splendour do not yield to silk; nay, what is wonderful for barbarians, they are so neat in their weaving that the elegance is nearly equal throughout, nor is the web or woof ever apparent. The antient Peruvian monarchs kept up many works for weaving *Cumbi*, the principal artificers in which lived at Capachica, on the banks of the lake Titicaca. These wools they dyed with the juice of various according as the nature of the work required. But most of the Peruvian barbarians are cunning in this weaving, and have in their huts instruments adapted for the art; and from these sheep they draw most of the necessaries of human life. By far the greatest use of these animals however is in carrying burthens; for sometimes 300, sometimes a drove of 1000, carry various articles of merchandise, skins of wine, chocolate (cocam), maize, *Chunno*, and quicksilver to Potosi and the other mines and towns.' Acosta then speaks of their employment in conveying silver from Potosi, &c., and observes that he has often wondered how droves of these animals, sometimes consisting of 1000, sometimes of two only, and not unfrequently laden with 3000 bars or plates (laminæ) of silver, worth 3000 ducats, should make their way, accompanied by a few barbarians only, who direct them, and load and unload their burthens, and hardly attended by one or two Spaniards, passing the night in the open air and without a guard,—and that so safely that a bar is scarcely ever missed, such is the security of travelling in Peru. 'The burthen of each beast,' continues Acosta, 'amounts to 100 and sometimes 150 lbs., which they carry three, or at the most four, leagues a-day, according to the length of the journey. But their leaders know their stations, where food and water for their cattle abound: here they pitch their tents, and unload their beasts. When however they have only one day's journey to make, the Llamas are able to bear a load of even 200 lbs., or to move forward as many as eight or ten leagues. These animals rejoice rather in a cool than in a fervid temperature, and therefore they are propagated immensely in the mountains, whilst they fail in the plains, on account of the too great heat. The bald sheep (calvum pecus), or Guanacoes, are of a fawning (vernile) and gentle aspect: often, as they walk along, they stop and regard the passers-by without any expression of fear or pleasure, so attentively with erected neck, that it is difficult to abstain from laughter; sometimes they are so suddenly terrified, that they run off to the mountain precipices with the greatest swiftness, so that it is necessary to shoot them to save their loads. The Pacoes also become so enraged sometimes, or are so wearied with their burthens, that they lie down with their burthens, and cannot be made to rise either by threats or blows; whence a proverb has arisen, and stubborn or obstinate men are said to be *Impacatos*. For this there is no better remedy than for the conductor to stop and sit down by the animal, until by his blandishments he prevails on the animal to rise spontaneously.'

It further appears that the Llamas are subject to scab, called by the 'barbarians' *carachen*, which is deadly not only to the animal which has taken it, but spreads by contagion among the flock, so that almost the only remedy is immediately to bury the diseased animal. Garcilaso however mentions other remedies: the most powerful is stated to be a very simple one, namely, anointing the affected parts with lard (adipe suilla). The price of a Llama varies in different provinces; but the 'barbarian' who possesses two or three is considered sufficiently rich. Garcilaso adds that the Peruvians, before the arrival of the Spaniards, did not milk their flocks, which give that secretion very sparingly, and only in sufficient quantity for their young; neither did they make cheeses of their milk.

De Laet then proceeds to state, that besides these domestic herds, Peru produces certain wild animals which are not easily to be seen in other parts of the New World, except in the neighbouring country of Chili. Some of these are called *Guanaco* or *Huanacu*, from a similitude to which the domestic kinds obtained the same name. The flesh of these is good, according to Garcilaso, but not so good as that of the domestic *Huanacu Llamas*. The males keep a look-out on the highest hills, whilst the females are feeding in the valleys; and when the former observe the approach of men from afar, they neigh almost like a horse, to warn the females. If the men come nearer, they flee, driving the females before them. The wool of these is short and rough, but it is notwithstanding used by the 'barbarians' for making cloth. These animals are taken in snares and nooses. Others again are called *Vicuñas:* these are not very unlike goats, except that they have no horns, and are larger, and are of a leonine colour or more ruddy; these live in the highest mountains and groves, and love the colder regions, but especially the solitudes which the Peruvians designate by the common name of *Punas;* neither are they annoyed by snow or frost, but are rather recreated thereby. They go in flocks, and run most swiftly. Such is their timidity, that at the sight of men or wild beasts they hurry instantly into inaccessible or hidden fastnesses. There were formerly a great number of these animals here, but they are now become much more rare on account of the promiscuous licence in hunting. Their wool is very fine, and like silk, or rather like the wool of the Beaver, and the natives deservedly estimate it highly; for besides other properties, it is also said to resist the heat and impart coolness, whence it is especially used for caps. Next to these come the *Tarugas* or *Tarucas*, which are larger and more swift than the Vicuñas, and of a more burnt colour, with pendulous and light ears: they rarely collect in herds, and generally wander about the precipices singly. Garcilaso says that these are a species of deer, but less than those of Europe. They were innumerable in the time of the Yncas, so that they entered the very towns; nor was there any deficiency of their fawns and does. Thus far De Laet, who says that all these animals produce bezoar stones, of which those of the *Pacoes* and *Guanacoes* are the smallest and lowest in estimation, whilst those from the *Vicuñas* are rather larger and better, and those of the *Tarugas* the best of all.

We now turn to Hernandez. We find in the Roman edition (fol. 1651) a figure of the '*Pelon Ichiatl Oquitli*, Ovis Peruviana,' with a description. Both figure and description leave no doubt that the brown Llama is the animal represented. There is a very long commentary, well worth the attention of the curious reader. Of this '*Aries* sive *Ovis Peruviana*,' two kinds are mentioned: the first like the animal represented; the other small and stunted (parvæ et pygmææ), with short legs, but strong and able to carry domestic burthens, such as water, corn, &c. Another kind, the *Pacos*, are stated not to be so corpulent. In the catalogue of Hernandez the *Pelon Ichiatl Oquitli* is called *Peruichatl*.

Marcgrave gives a figure of the long-wooled and larger *Llama*, under the name of *Ovi-camelus*. In some parts it is not bad; in others, the muzzle and fore-feet for instance, it is monstrous. He says that the larger kind of *Ovi-camelus* is called *Paco*. His description is worth consulting; and he says, among other statements, that they bore the ears of these 'sheep,' and run ropes through them, by which their masters manage them and lead them where they please. He then gives another figure, much better executed than the other, of a second species, which is nearly naked in regard to fleece, and is only covered by a light and short one (calvum pecus of De Laet?); and says that it partly resembles a camel and partly a deer, so that it might be well called in Greek ἐλαφοκάμηλος—Elaphocamelus.

We gather then from these and other early writers, that there were three kinds of these animals, *Guanacoes* or *Huanacoes*, *Pacoes*, and *Vicuñas*, the term *Llama* being applicable to each of them, and merely signifying cattle or sheep, but these kinds are by no means clearly defined. 'Until the last half century,' says Mr. Bennett, 'the great majority of naturalists, including Ray, Klein, Brisson, and Linnæus, concurred in reducing them to two species, the *Llama* or *Guanaco*, commonly used as a beast of burthen, and the *Paco* or *Vicugna*, cultivated for its flesh and its wool. Of this opinion was Buffon when he wrote the history of the Llama and the Paco; but the observation of living specimens of the Llama and the Vicugna, and the communications of the Abbé Béliardy on the subject, induced him afterwards to admit the latter animal as a third species distinct from the preceding. In this he was followed by Molina, who, in his 'Natural History of Chili,' separated also the Guanaco, and added a fifth species, the Hueque, or Chilian sheep of the older authors. Gmelin, Shaw, and almost every subsequent compiler, have adopted these five species without examination, giving to them such synonyms as they could pick up almost indiscriminately from the writers on the natural history of America, and thus creating a mass of confusion which it would be both vain and useless to attempt to unravel.' (*Gardens and Menagerie of the Zoological Society.*)

Pennant gives as species the *Llama*, the *Vicuña*, the *Paco*, the *Guanaco*, and the *Chilihueque*, but gives figures of the first two only.

M. F. Cuvier makes the number of species three—the Llama, the Paco, and the Vicuña; M. Lesson gives the same; Dr. Fischer records the same three and a fourth, *Auchenia Arucana* (Chilihueque) as doubtful. In his addenda et emendanda he notices *L. Huanaca* (Auchenia

Huanaca, Hamilt. Smith; *Cervocamelus* of Jonston) with a query if it is not a mere variety of *L. Peruana*. As a synonym to *Lama Paco* he adds *Auchenia Paco* (Hamilt. Smith), *Camelus Guanaco* (Traill). To *Lama Vicuña* he adds *Auchenia Vicugna* (Hamilt. Smith), less than the former; and to *Lama Arucana, Auchenia Arucana* (Hamilt. Smith).

Mr. Bennett observes that it seems to be the general opinion among the leading writers of the present day that the subdivision of the genus has been carried to too great an extent. He thinks that M. F. Cuvier is fully justified by the imperfect accounts of Molina in rejecting as species the *Guanaco* and the *Hueque* of that writer. Mr. Bennett states that he should have little hesitation in proceeding still further, for he is strongly inclined to agree with Baron Cuvier in regarding the *Paco* as a mere variety of the *Llama* with the wool more amply developed; and in considering the *Vicuña* as the only animal of the group that deserves to be specifically distinguished from the latter. Skeletons of both the Llama and Vicuña are preserved in the Museum of the College of Surgeons, London.

Geographical Distribution.—The Cordiller a of the Andes, below the line of perpetual snow. Peru (but not in Mexico) and Chili principally, though now much reduced in numbers; in Columbia and Paraguay they are more rare. Most of the navigators to the Straits of Magalhaens and south-western coasts of America mention Guanacoes from early times down to the expeditions under Captain King and Captain Fitzroy inclusive, and the flesh of these animals has afforded a salutary refreshment to the crews.

Habits, Food, Reproduction, &c.—The habits of the Llamas may be in great measure gathered from the descriptions of the Spanish writers above given. In a wild state they keep together in herds, sometimes of one or two hundred, feeding on a sort of rushy grass or reed called *ycho*, which grows on the mountains, and, it is said, never drinking when they have sufficient green herbage. They resort to a particular spot to drop their dung, which a good deal resembles that of a goat, sheep, or giraffe, a habit which is often fatal to them from betraying their haunts. Modern observers have noticed the careful look-out that they keep, and the rapidity with which they flee, then turn to gaze, and again swiftly gallop off. Molina says that the Guanacoes leave the mountains, where they passed the summer, at the beginning of winter, when they descend to the plains. Here they are hunted down, at least the young and inactive, with dogs by the Chilians. During the chace they are said frequently to turn upon their pursuers, neigh loudly, and then take to their heels again. Another mode of capturing them by the Indians is for many hunters to join and drive them into a narrow pass, across which cords have been drawn about four feet from the ground, with bits of cloth or wool tied to them at small distances, somewhat in the way adopted by gardeners to keep small birds from the seeds. This apparatus with its pendent trumpery frightens the animals, and they get together, when the hunters kill them with stones tied to the end of leathern thongs. If there are any Guanacoes among them, they leap the cords and are followed by the Vicuñas. Those that we have seen in captivity have been tolerably mild and tame, but very capricious, accepting biscuits and such delicacies from visitors, but ejecting a copious shower of saliva in their faces at the least real or fancied affront. This shower, though sufficiently unpleasant, has not, as far as our experience goes, the acrid and blistering properties ascribed to it by some authors. Genitale masculum tenue est, et recurvum. Est autem luxuriosum valde, et turpius in exercendo venereo actu, quam ullum mundi animal. Fœmina enim vulvam habet nimis parvam, quæ in terra jacens ita se componit, ut mas illi supervenire queat, qui tunc temporis gemitus specie maximè vociferatur, nec aliud tunc quasi fit, quam quod unum alterum conspuat, et non raro diem integrum consumant, ante quam actum ipsum venereum incipiant et absolvant. To the general truth of this account of the commentator on Hernandez we can bear testimony. The female, which has only two teats, is said to go six months with young.

Utility to Man.—We need not here repeat those uses to which these animals have been applied by man. Cords and sacks, as well as stuffs for ponchos, &c., are fabricated from the wool*, and the bones are converted into instruments for weaving the same. Nor is even the dung neglected, for it is used as fuel. In short, these animals seem to have been to the aborigines what the reindeer (with the exception of the milk) is to the Laplander. Surrounded by herds of such animals which required almost no care, and by the spontaneous productions of the soil, the Indian had no incentive to improvement. Humboldt has an eloquent passage on this subject. 'When we attentively examine this wild part of America, we seem to be carried back to the first ages when the earth was peopled step by step; we appear to assist at the birth of human societies. In the Old World, we behold the pastoral life prepare a people of huntsmen for the agricultural life. In the New World, we

Male Brown Llama. (F. Cuvier.)

Paco. (F. Cuvier.)

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* In reference to the wool we may here state, that a herd of 36, including the kinds called Llamas, Alpacas, and Vicunas or Vigonias, were sent from Lima (Peru) and Concepçion (Chili) to Buenos Ayres by journeys of two or three leagues. To those who may be inclined to import these animals it may be necessary to state that they were fed during the journey with potatoes, maize, and hay: as soon however as the potatoes were exhausted, constipation came on so obstinately that medical relief was required. They were shipped as a present from Godoy, the Prince of the Peace, to the Empress Josephine, but only eleven arrived at Cadiz in 1808, just as Godoy fell into disgrace. Here two died, and indeed the rest were near being thrown into the sea by the infuriated rabble, in their detestation of the late minister and minion. The poor Llamas were however saved from the tender mercies of the populace by the governor of Cadiz, and were consigned to Don Francisco de Theran of Andalusia, who had a fine menagerie at San Lucar de Barrameda. When the French occupied the province, Marshal Soult protected them, and M. Bory St. Vincent, who was with the army, studied their habits and executed drawings of them, which were lost at the battle of Vittoria. M. Bory paid great attention to their wool, and some from each of the kinds was sent to the Academy of Sciences at Paris. From the report of the French naturalist and the philosophical Spaniard, it would appear that the fleece of the Alpa-vigonia (produced by a cross between a Vigonia and an Alpaca) has much greater length than that of any other variety and is six times heavier.

See 'The Menageries,' vol. i., published by the Society for the Diffusion of Useful Knowledge, where much interesting information is collected.

look in vain for these progressive developments of civilization, these moments of repose, these resting-places in the life of a people. . . . Those species of ruminating animals which constitute the riches of the people of the Old World are wanting in the New. The bison and the musk ox have not yet been reduced to the domestic state; the enormous multiplication of the Llama and the Guanaco have not produced in the natives the habits of the pastoral life.' These multitudes are already lessened, and the form itself will probably ere long be extinct. Civilization has brought with it the animals of the Old Continent. The horse and the mule have almost entirely superseded the Llamas as beasts of burthen, and the sheep and the goat, in great measure, as contributors to the food and raiment of man.

Vicuna. (Buffon.)

Brown Llama, exhibited in England.

The white Llama, according to Feuillée, is said to have been the presiding deity of the natives of Callao, before that province was annexed to the empire of the Yncas.

ARRANGEMENT.

The similarity to the Camel appears to have struck every writer who has treated of the Llama.

Linnæus places the genus *Camelus* at the head of his Pecora, and makes *Glama* and *Pacos* species of that genus. *Camelus* is followed by *Moschus*.

White Llama, exhibited in England.

Pennant also arranges the *Llama* and *Pacos*, &c., under his genus *Camel*, which is placed between the *Musk* and the *Hog*.

Gmelin retains the Linnean arrangement, adding three (so called) species to those recorded by Linnæus.

Cuvier places the great genus *Camelus* at the head of the *Ruminants*, and makes it consist of the Camels properly so called and the *Llamas* (Auchenia). *Camelus* is followed by *Moschus*.

Mr. Gray makes his subfamily *Camelina*, the third of his family *Bovidæ*, consist of *Camelus* and *Auchenia*.

M. Lesson arranges the Llamas as the third genus of his *Camelĉes*, the two first being *Camelus* and *Mericotherium*. This third and last genus is immediately succeeded by the *Moschinĉes*.

Dr. Fischer, following Linnæus, places *Camelus* at the head of the *Pecora;* that genus is followed by *Lama;* and *Lama* by *Moschus*.

Mr. Swainson (1835) makes the '*Solipedes*, single-hoofed quadrupeds,' his fifth tribe of *Ungulata*, consist of the genera *Camelus*, *Auchenia*, and *Equus*.

Mr. Ogilby (1836) gives the *Camelidæ* as the first family of the order *Ruminantia*, with the following characters:—

Fam. 1. Camelidæ.

Feet subbisculcate, callous beneath, toes distinct at the tip from the sole; no spurious hoofs, no horns; *incisor teeth*, two above, six below.

2. Genera.
   1. *Camelus*, whose characters are—
      Toes conjoined, immoveable.
      Muzzle furnished with a *chiloma*,* the upper lip (labrum) divided.
      Lachrymal Sinuses, none.
      Interdigital Pits, none.
      Inguinal Follicles, none.
      Teats, four.
   2. Auchenia.
      Toes disjoined, moveable.
      Muzzle furnished with a *chiloma*, the upper lip divided.
      Lachrymal Sinuses, none.
      Interdigital Pits, none.
      Inguinal Follicles, none.
      Teats, two.

Mr. Ogilby goes on to state that the *Camelidæ* form what Mr. MacLeay would call an aberrant group; they

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* Tumid upper lip continuous with the nose or nostril.

ıtially, observes the former, from other Rumi-
e structure both of the organs of locomotion and
:ion, and their generic distinctions consequently
ɔn characters which have no application to the re-
·oups of the order. On the other hand, the prin-
ɜneric distribution which subsist among the rest
inantia appear, in Mr. Ogilby's opinion, to furnish
haracters only when applied to the *Camelidæ*;
. necessarily expressed negatively, the absence of
inguinal, and interdigital sinuses forms, in
sitive and substantial characters; and as such,
ntroduced into the definition of these, as well as
enera, in which they unavoidably appear in a
rm. The *Camelidæ*, in Mr. Ogilby's arrange-
immediately followed by the *Cervidæ*. (*Zool.*
.)

ossil species of *Auchenia* has yet been discovered;
rwin brought home from South America the
a most interesting animal nearly allied to the
ich Mr. Owen has characterized under the name
chenia. [MACRAUCHENIA.] The cervical ver-
is form present the same character in the absence
s for the vertebral arteries in the transverse pro-
ı the Llamas and Camels. (Owen.)

)AFF. [GLAMORGANSHIRE.]

)ILO-VAWR. [CAERMARTHENSHIRE.]

)OVERY. [CAERMARTHENSHIRE.]

.LLY. [CAERMARTHENSHIRE.]

·OLLEN. [DENBIGHSHIRE.]

)S. [PLAINS.]

:WST. [DENBIGHSHIRE.]

, a town in France, capital of the department of
52 miles west by north of Paris, in a straight
miles by the road through Evreux, Lisieux, and
e origin of this town is disputed. It stands on
ire, and is irregularly built: it has a fine 'place,'
ace. There are four parish churches, of which
tre Dame is the principal. The church of Ste
ı the Norman style, of which it is considered to
.t preserved specimen in France. The prefect's
ly erected, the town-hall, the courts of law, and
. are the chief public buildings. The population,
as 8154 for the town, or 8421 for the whole com-
1836 it was 9065 for the commune, showing an
five years of 644, or about seven and a half per
: chief manufactures are of fine woollen cloths,
uggets, and woollen shawls; bed-ticks, calico,
tape; woollen and cotton yarn; leather, common
d iron goods. There are slate-quarries in the
ıood. The chief trade is in the above manufac-
n, salt butter, cider, honey, corn, cattle, horses,
y. There are eight well-frequented fairs in the
ɜre are a Society of Agriculture and Commerce,
ool, a public library of 5000 volumes, an hospital,
public baths, and several government offices.
ondissement comprehends 436 square miles, and
31, a population of 99,250; in 1836, of 100,717.
vided into nine cantons and 120 communes.

I. [COBITIS.]

STONE. [IRON—*Ores*.]

, a soil compounded of various earths, of which
are silicious sand, clay, and carbonate of lime, or
he other substances which are occasionally found
such as iron, magnesia, and various salts, are
ı such proportions as materially to alter their
)ecayed vegetable and animal matter, in the form
, is often found in loams in considerable quan-
. the soil is fertile in proportion.
:ng as the loams are composed, so they vary in
Those which consist of a great portion of loose
ı little humus, and with an impregnation of iron,
ınproductive; and those which contain too much
are on an impervious subsoil, are very difficult to
But between these extremes there are soils
ınot be surpassed in fertility as wheat-land. What
ains so much more fertile than either clays or
that the pure earths are in themselves almost
arren: sand lets the moisture run through it and
rapidly; clay retains it, but locks it up in its
:ance, and does not allow the tender young roots of
push through it; chalk has the same mechanical
esides containing very little organic and soluble
om which plants derive their chief increase. Sand and clay alone, without a considerable portion of humus, will not make a rich soil: but when a portion of calcareous earth is joined to both, the humus is more readily rendered soluble, and the clay and sand are prevented from forming a mortar, which would harden too readily, and prevent the influence of the air from reaching the roots. Good loams allow of that circulation of moisture which acts so prominent a part in the process of vegetation. It is almost universally admitted that the most fertile soils always contain a proportion of calcareous matter; and by adding chalk to those soils in which it does not abound, whether sandy or argillaceous, a manifest improvement is always produced.

It has been asserted that in the climate of France, in the neighbourhood of Paris, the best soil for the growth of wheat is composed of equal portions of fine sand, clay, and chalk. Upon what grounds this is assumed, does not appear very clear. The greater the natural moisture of any climate, the greater proportion of sand is required to make a fertile loam; and the greater the proportion of humus, the less sand will be required to temper the clay. The analysis of soils known to be extremely fertile gives a very great difference in the proportions of the different earths.

In the climate of England the soil which is generally preferred for cultivation is a loam, rather light than heavy; at least half of which is silicious sand, one-third clay, and the rest chalk. Such a soil is called a good loam; it is land which will produce almost every thing which is usually cultivated on sands or clays: it is not too stiff for carrots and turnips, and not too loose for wheat and beans. It is of most easy cultivation at all times of the year, provided the subsoil be sound, and not too retentive of water. It requires only to be occasionally recruited with manure, to restore to it the humus which vegetation has consumed, and to be kept free from the weeds which naturally spring up in all fertile soils. All attempts to improve the nature of a soil should have for their object the bringing it to a state of loam, by the addition of those substances which are deficient. If there is too much clay, chalk and sand may be added, or a portion of the clay may be calcined by burning, in order to destroy its attraction for water, and thus act the part of sand in forming the loam. Limestone or calcareous sand and gravel are still more efficacious for this purpose: they not only correct too great porosity, or too great tenacity, but also act chemically on the organic matter in the soil, rendering the humus soluble, and fit to be taken up by the roots of plants. If there is too much sand, marl composed of clay and chalk is the remedy. Good loams require much less tillage than stiffer soils, and will bear more stirring to clean them than sands. Hence they are cultivated more economically, and more easily kept free from useless weeds; while the produce is more certain and abundant. They can be impregnated to a higher degree with enriching manures, without danger of root-fallen crops, or of too great an abundance of straw at the expense of the grain. For artificial meadows they are eminently proper: all the grasses grow well in good loams, when they are on a dry or well-drained subsoil, which is an indispensable condition in all good land. Sheep and cattle can be depastured on them during the whole year, except when there is snow on the ground. If there should be means of irrigation, no soil is better suited to it than a light loam on a bed of gravel; or even if the subsoil is clay, provided sufficient under-draining prevent the water from stagnating between the soil and subsoil, which, as practical men very properly express it, would poison any land.

A loamy soil requires less dung to keep it in heart than either clay or sand; for while it is favourable to the process by which organic matter buried deep in the soil is converted into insoluble humus, it also permits that part of it which is nearer to the surface to attract oxygen from the air, and thus it is converted into a soluble extract, which is to the roots of plants what the milk of animals is to their young—a ready-prepared food easily converted into vegetable juices.

The analysis and classification of soils is of the greatest importance to all those who take farms; for the rent of land is very seldom proportioned to its intrinsic value: one farm may be worth double the rent of another, where the apparent difference in the soil is very trifling. Those who have had long experience of the expense of cultivation, and the average produce of certain lands, can nearly guess what rent it may be safe to offer; but a stranger has no criterion to judge by. Hence it is notorious tha stranger coming to take a farm from a distant district is almost invariably deceived. Why should not the value of a soil be ascertained as readily as that of any article of commerce? If there were certain points of comparison, it would be so; but in this the theory of agriculture is wofully deficient. A man guesses at the qualities of land by the colour, the feeling, and other uncertain signs: it seldom or never occurs to a farmer to examine the component parts of a soil, by merely diffusing a portion in water, and testing the deposits—much less to compound artificial soils, and compare them with those found in the fields. Yet every gardener can prepare soils suited to different plants, and make loams of all degrees of richness or consistence. In all these it will be found that sand, clay, chalk, and decayed vegetable substances, in various proportions, are the chief ingredients. If therefore these are found in a natural loam, we may safely conclude that it will be equally productive, and the deficiency of any one ingredient may be supplied artificially. This would be going rationally and scientifically to work; and the result would be a more certain and satisfactory practice of husbandry.

It might be an interesting and highly useful inquiry to ascertain the effect of the contact of various kinds of earth, moistened with water, in exciting galvanic action, which no doubt greatly influences the chemical affinities of the elements from which the plants derive their increase. It is a subject which has scarcely ever been noticed, and we would strongly recommend scientific experiments in this branch of vegetable physiology.

LOANGO, on the west coast of Africa, is the most northern of the four countries or districts which are said to have antiently constituted the kingdom of Congo, as explained in the articles CONGO, ANGOLA, and BENGUELA. In the first-mentioned of these articles there is an enumeration of the chief authorities from which we derive our information respecting all these countries.

Loango extends along the coast from Cape Lopez Gonsalvo in 0° 44′ S. lat. to the river Congo or Zaire, which separates it from Congo in about 6° S. lat. To the north it is said to be bounded by Gabon, or Pongo, and to the east by the country called Mokoko, or Anziko. Pigafetta, on the information of Duarte Lopez, extends its limits into the interior about 200 miles from the coast.

According to Olferd Dapper, Loango, or Loangego, as he writes the name, was antiently only one of the divisions of the territory properly so called, others being Mayomba, or Majumba, Kilongo, Piri, and Wansi. Other early accounts describe the principal provinces of the kingdom of Loango as being Loangiri, Loangomongo, Kilongo, and Piri. To these others add Sette, Gobbi, and other districts.

Loango, the capital town, called by the natives Banza Loangiri, is in the province of the same name, which occupies the south-western angle of the country. It stands in a large plain, at the distance of three miles from the sea. It is described both by Battel and Dapper, and the latter also gives an engraved representation of it. Here, among other buildings is or was attached to the royal palace the dwelling of the king's wives, stated to be five hundred in number. The reigning king in Battel's time (1589—1607) had four hundred children.

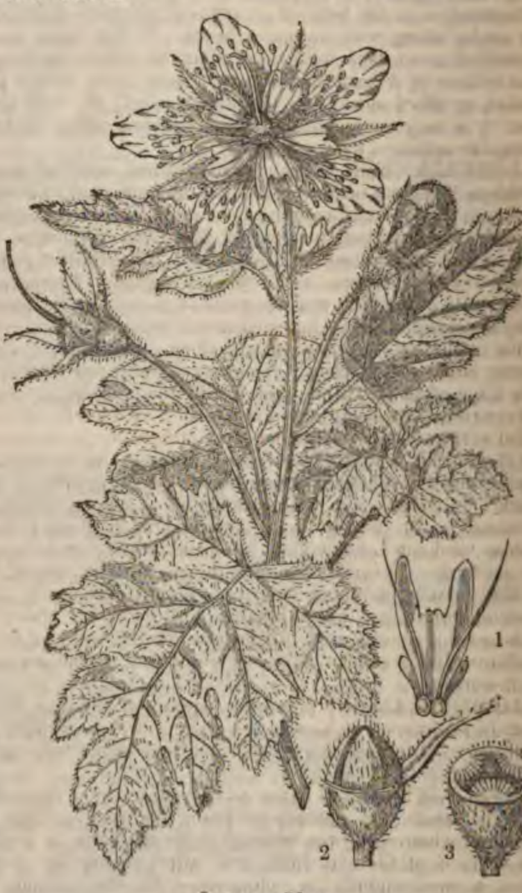
Another account gives the king seven thousand wives, one of whom occupies a very extraordinary position, having, it is affirmed, the right of directing the entire public conduct of the king, and of taking his life if he refuse to obey her commands. Nay, although married to the king, she may choose any other man she pleases for her lover, and all the children she produces are still accounted of the blood royal. At the same time it is death for her gallant to be surprised in the embraces of another woman. This highly privileged lady is nominated by the king himself to the post she fills, and is known by the name of the Makonda.

The government, like that generally prevalent among the barbarous tribes of this part of Africa, is the most absolute species of despotism. Battel states that the kings of Loango are believed by their subjects to be divinities, and that the titles by which they are known, Samba and Pango, have that signification in the language of the country. In particular, they are held to have the power of bringing down rain from the sky; and this useful prerogative they exercise every year, on the petition of their subjects, with great ceremony. On one occasion when Battel was present, an abundant shower fell on the afternoon of the same day on which the king, seated on his throne, and surrounded by the admiring multitude, had issued the usual command to the heavens by hurling a spear into the air; a circumstance which excited the sentiment of the national superstition to a wonderful pitch of enthusiasm. The successor to the throne is the king's next eldest brother, or, if he have no brother, the eldest son of his eldest sister. Although the king however is independent of the nobles, the latter in their own sphere appear to exercise unlimited tyranny over the common people. The religion of the country is an idolatry of the most superstitious character.

A great part of the country is covered with thick woods, and it is only mountainous in the interior towards the south. In the north it possesses some lakes of considerable extent, from which, and from the mountains, many rivers descend to the sea. Among these however there are none of much magnitude, with the exception of the Banna, at the mouth of which stands the town of Mayomba, about six miles south from Cape Negro, or nearly in 3° 30′ S. lat.

The sea contains fish in abundance, which form a great part of the sustenance of the people; the produce of the soil, which is said to yield three harvests in the year, with very little cultivation, consists of various kinds of grain, such as are raised in the adjacent regions. Among the trees are some dyeing woods. The only mineral found in the country seems to be iron. The principal animals that are mentioned are elephants and apes, both of which were formerly very numerous.

LOASA'CEÆ, a small natural order of polypetalous Exogens, consists of herbaceous and frequently annual plants covered over with stiff hairs or stings, which produce considerable pain by the wounds they inflict. They have alternate lobed leaves without stipules, large yellow, red, or white flowers, numerous polyadelphous stamens, within which are stationed singular lobed petaloid appendages, and an inferior ovary with parietal placentæ. The fruit is a dry or fleshy capsule, with the valves sometimes twisted spirally. The order is nearly allied to Cucurbitaceæ; all the known species are American, and the greater part from Chili and Peru. The genera in gardens are Loasa, Mentzelia, and Blumenbachia.



Loasa grandiflora.

1, one of the appendages within the stamens; 2, an ovary with all the sepals cut off except one; 3, a transverse section of the ovary, showing the parietal placentation.

LOBA'RIA. [BULLADÆ, vol. vi., p. 11.]

LOBE'IRA VASCO. [AMADIS DE GAULA.]

L'OBEL, or LOBEL, MATTHEW, one of the founders of the science of systematic botany, was born in Flanders, n the year 1558, travelled in various parts of the middle and south of Europe, and finally settled in England, where he became physician to James I. He is chiefly known now as the author of botanical works illustrated by great numbers of figures, of which there are above 2000 in his 'Plantarum Historia,' a folio work published at Antwerp, in 1576, and still referred to by critical writers on systematic botany. But his name deserves mention more particularly as that of the first naturalist who devised the present method of arranging plants in their natural orders, rudely indeed, but with sufficient distinctness. In his 'Stirpium nova adversaria,' published in London, in 1570, and dedicated to Queen Elizabeth, he expressly mentions Gramineæ, Acori, under which Iridaceæ and Zingiberaceæ are included, Asphodeleæ, Serides or Cichoraceæ, Atriplices or Chenopodiaceæ, Brassicæ or Cruciferæ, Glaucia or Papaveraceæ, Labiatæ, Asperifoliæ, Leguminosæ, and some others. Lobel died at Highgate, near London, in 1616. The genus Lobelia was dedicated to him by Linnæus.

LOBE'LIA INFLA'TA, or Indian tobacco, an annual plant, growing in most districts of North America, of which he oval obtuse leaves are used in medicine. They have an undulated and irregularly-toothed margin, rough surace, and slightly pilose below, possessing a taste which gradually becomes acrid and pungent. The inflated capules possess the same virtues.

The action on the human system is nearly the same as hat of tobacco when chewed, producing a copious flow of aliva, and if swallowed in considerable dose causing great elaxation of all muscular structures, including the heart and arteries, accompanied with debility and cold perspiraions, and also paleness of the surface. In large doses it proves decidedly poisonous. It frequently acts as an emetic and expectorant when given in small and regulated doses.

It has been found eminently useful in warding off or cutting short a paroxysm of asthma, either taken internally in substance, or in the form of an ætherial tincture, or inhaled as smoke along with aromatic herbs. It has been found beneficial as an expectorant and relaxant in hooping-cough, but neither in it nor asthma does it prove more than a palliative, or afford more than temporary relief; as such however it is very serviceable in some nervous affections with irregular action of the heart.

LOBELIA'CEÆ, an important natural order of monopetalous Exogens, differing from Campanulaceæ in having irregular flowers and syngenesious stamens, but otherwise resembling them very nearly; of these two characters the ast is the most absolute, Isotoma, a lobeliaceous genus, being so called because its flowers are regular. The species principally inhabit the warmer parts of the world; in Europe hey are rare, in North America much more common, especially in the southern states, and they are abundant in the hotter countries of South America. Many are found at he Cape of Good Hope, and in the north of India; their favourite haunts being damp woods or situations freely supplied with moisture. They abound in a milky juice, which n all is acrid, and in some so intensely so as to produce dangerous or even fatal consequences when applied to the urface of the body or taken internally. Among the most virulent is the Hippobroma longiflorum, a West Indian pecies, and the Lobelia Tupa, a Chilian plant now common n gardens. Nevertheless certain species have proved, in kilful hands, valuable curative agents, especially the *Lobelia inflata*, or Indian tobacco. Many of the plants of his order are cultivated in gardens for the sake of their brilliant blue or scarlet flowers: white and yellow are rare n the order.

LO'BIPES, Cuvier's name for a genus of Wading Birds family *Longirostres*, Cuv.), the type of which is *Tringa yperborea*, Linn. The genus is identical with *Phalaropus* f Vieillot.

LO'BO, JEROME, a native of Lisbon, entered the order f the Jesuits, and became professor in their college at Coimbra, whence he was ordered to the missions in India. He arrived at Goa in 1622, and after remaining there about a twelvemonth he volunteered for the mission to Abyssinia. The sovereign of that country, whom Lobo calls ultan Segued, had turned Catholic through the instrumentality of Father Paez, who had gone to Abyssinia in 1603. The connexion between Abyssinia and Portugal had begun nearly a century before, when the Negus, or emperor David, having asked the assistance of the Portuguese against the Moors of Adel, Don Christopher de Gama, one of the sons of the discoverer Vasco de Gama, was sent from India with 400 men to Abyssinia. [ALVAREZ, FRANCISCO.]

Lobo sailed from Goa in 1624, and landed at Paté, on the coast of Mombaza, thinking of reaching Abyssinia by land. The empire of Abyssinia then extended much farther south than it does at present; and this route was considered by the Portuguese in India as preferable to that by the Red Sea, the coasts of which were in the hands of the Turks. Lobo proceeded some distance from Paté to the northward among the Gallas, of whom he gives an account, but finding it impracticable to penetrate into Abyssinia by that way, he retraced his steps to the coast and embarked for India.

In the following year (1625) he sailed again with Mendez, the newly appointed patriarch of Ethiopia, and other missionaries. This time they sailed up the Red Sea and landed at Belur, or Belal Bay, 13° 14′ N. lat., on the Dancali coast, whose sheik was tributary to Abyssinia, and thence crossing the salt plain he entered Tigré by a mountain-pass and arrived at Fremona near Duan, where the missionary settlement was. Here Lobo remained the remainder of that year, after which the patriarch proceeded to the emperor's court, but Lobo remained in Tigré, where he spent several years as superintendent of the missions in that kingdom. A revolt of the viceroy of Tigré, Tecla Georgis, put Lobo in great danger, for the rebels were joined by the Abyssinian priests, who hated the Catholic missionaries, and indeed represented the protection given to them by the emperor Segued as the greatest cause of complaint against him. The viceroy however was defeated, arrested and hanged, and Lobo, having repaired to the emperor's court, was afterwards sent by his superiors to the kingdom of Damot. He here introduces in his narrative an account of the Nile and its sources, 'partly,' he says, 'from what he had himself seen, and partly from what he had heard from the natives.' His account coincides in the main with the subsequent observations of Bruce and others. From Damot Lobo after some time returned again to Tigré, where the persecution raised by the son and successor of Segued overtook him. All the Portuguese, to the number of 400, with the patriarch, a bishop, and eighteen Jesuits, were compelled to leave the country in 1634. They put themselves under the protection of the Bahrnegash, by whom however they were given up to the Turks at Masowah, who demanded a ransom. Lobo was sent to India for the purpose, and he endeavoured strongly to persuade the Portuguese viceroy to send a squadron with troops to take possession of Masowah, but the viceroy had not the spirit nor perhaps the means to follow his advice, and referred him to Lisbon. Lobo sailed for Europe, but, as he himself says at the end of his narrative, 'never had any man a voyage so troublesome as mine, or interrupted by such a variety of unhappy accidents. I was shipwrecked on the coast of Natal, was taken by the Hollanders, and it is not easy to mention the dangers which I was exposed to both by land and sea before I arrived in Portugal.' Portugal was then under the king of Spain, and Lobo was sent to Madrid, where he found still more indifference with regard to Abyssinian affairs than he had experienced at Goa. Still engrossed by his favourite idea, that of reclaiming Abyssinia to the Catholic faith by means of Portuguese influence and arms, Lobo set off for Rome, but there also he found little encouragement.

In 1640 he returned to India, and became rector and afterwards provincial of the Jesuits at Goa. In 1656 he returned to Lisbon; and in 1659 he published the narrative of his journey to Abyssinia, under the title of 'History of Ethiopia,' which was afterwards translated into French by the Abbé Legrand, who added a continuation of the history of the Catholic missions in Abyssinia after Lobo's departure, and also an account of the expedition of Poncet, a French surgeon, who reached that country from Egypt, and a subsequent attempt made by Du Roule, who bore a sort of diplomatic character from the French court, but was murdered on his way, at Sennaar, in 1705. This is followed by several dissertations on the history, religion, government, &c., of Abyssinia. The whole was translated into English by Dr. Johnson in 1735. There had already appeared

1675 a little work published by the Royal Society of London, said to be translated from a Portuguese MS., styled 'A Short Relation of the River Nile,' which is also found in Thévénot's collection, and the original of which is Lobo's. Many of the particulars coincide with those in the larger narrative. Lobo died at Lisbon in 1678. He was a man of abilities, enterprise, and perseverance, and altogether well qualified for the mission which he undertook.

LOBOPHY'LLIA. A portion of the animals included in Lamarck's genus Caryophyllia is thus named by Blainville. [MADREPHYLLIŒA.]

LOBSTER. [ASTACUS; CRUSTACEA; HOMARUS.]

LOBULA'RIA, a group of recent zoophyta, separated from the Linnæan Alcyonia. [ALCYONEÆ.]

LOCARNO. [TICINO.]

LOCHABER, a district of Scotland in the south-west of Inverness-shire, which takes its name from 'Lochaber,' a small lake in the vicinity of Fort William, which, according to Camden, was formerly written 'Loghuaber,' signifying the mouth of the lakes. The north-western boundary of this district is formed by Loch Eil, Loch Lochie, and the Caledonial Canal, while towards the south and south-west it is terminated by the shires of Perth and Argyle, from which it is partly separated by Loch Leven. The north-eastern boundary is formed by the district of Badenoch; but the natural limits in this direction are not distinctly defined, and moreover those given by different authorities are not quite in accordance. In the map of Inverness-shire published in the 'New Statistical Account of Scotland' the north-eastern boundary is nearly a straight line joining the southern extremity of Loch Ericht and the northern extremity of Loch Lochie, according to which the greatest length of the district, from north-west to south-east, does not exceed 32 miles, while its greatest width, between Lochs Lochie and Ericht, is about 20 miles; and as its form, as there given, is nearly triangular, the area must be about 320 square miles. But in the Map of Scotland published by the Society for the Diffusion of Useful Knowledge the district appears to extend as far north-east as Loch Spey; whereby its superficial extent is somewhat augmented.

LOCHES. [INDRE ET LOIRE.]

LOCI. [LOCUS.]

LOCK, MATTHEW, an English composer of great and deserved celebrity, was born in Exeter, and, as a chorister of the cathedral, was instructed in the elements of music by Wake the organist. He completed his studies under Edward Gibbons, a brother of the illustrious Orlando. The continuator of Baker's *Chronicle* tells us that Lock was employed to write the music for the public entry of Charles II.; shortly after which he was appointed composer in ordinary to that king. Assuming that he had reached his 25th year at the period of the Restoration, the date of his birth may be fixed at 1635. His first publication was under the title of *A Little Consort of Three Parts, for Viols or Violins*, consisting of pavans, ayres, sarabands, &c.; the first twenty for two viols and a base. In Playford's *Catch that catch can* are glees, &c., by Lock, and among them that agreeable piece of vocal harmony, *Ne'er trouble thyself about Times or their Turnings*,

Lock was the first English composer for the stage. He set the instrumental music in the *Tempest*, as performed in 1673; and in the same year composed the overture, airs, &c. to Shadwell's *Psyche*, which he published two years after, with a preface betraying strong symptoms of that irascible temper which subsequently displayed itself in very glaring colours; first in a quarrel with the gentlemen of the chapel-royal; and next, in his opposition to a plan proposed for a great improvement in musical notation by the Rev. Thomas Salmon, A.M., of Trinity College, Oxford. The abusive and bitter terms in which he expressed himself in a pamphlet, entitled 'Observations on a late Book called an Essay,' &c., which is an answer to Salmon's proposal, are at once a distinct proof of Lock's uncontrolled violent disposition, and either of his utter incapability of justly estimating a plan which would have proved highly beneficial to the art, or of his selfishness in opposing what he may have thought likely to militate against his personal interests. [CLEF.] His resistance, backed by his prejudiced brethren, was unfortunately successful, and an opportunity was lost of accomplishing with ease that which every year's delay renders more difficult to effect, though ultimately, and at no distant period, the amelioration suggested by the above-named mathematician, or a still more complete and decided one, will be forced on the professors of music.

Lock contributed much to the musical publications of his day. His sacred compositions, some of which appear in the *Harmonia Sacra*, and in Boyce's *Collection of Cathedral Music*, are quaint, though they show that he was a master of harmony. But his *Music in Macbeth* is that on which his fame was built, and which will float his name down the stream of time: 'it is,' says his biographer, in *The Harmonicon*, 'a lasting monument of the author's creative power, and of his judgment. If the age in which it was produced, the infantine state of dramatic music at that period, the paucity and imperfectness of instruments, and the humble condition of what was then called an orchestra, be all duly considered, his work will be described, not as "a spark," as Dr. Burney calls it, but as a blaze of genius, the brightness of which neither years nor comparison have been able to dim, and which, could it have been aided by the enlarged means so plenteously afforded in after-times, would now have shone with a splendour that has rarely been equalled in any age or country.'

Lock died in 1677, having a few years before become a member of the Roman Catholic church. As a consequence of his conversion, he retired from the king's service, and was appointed organist to the consort of Charles, who was of the communion adopted by the composer.

LOCKE, JOHN, was born at Wrington near Bristol, on the 29th August, 1632. By the advice of Colonel Popham, under whom Locke's father had served in the parliamentary wars, Locke was placed at Westminster School, from which he was elected in 1651 to Christ Church, Oxford. He applied himself at that university with great diligence to the study of classical literature; and by the private reading of the works of Bacon and Descartes, he sought to acquire that aliment for his philosophical spirit which he did not find in the Aristotelian scholastic philosophy, as taught in the schools of Oxford. Though the writings of Descartes may have contributed, by their precision and scientific method, to the formation of his philosophical style, yet, if we may judge from the simply controversial notices of them in the 'Essay concerning Human Understanding,' they appear to have exercised a negative influence on the mind of Locke; while the principle of the Baconian method of observation gave to it that taste for experimental studies which forms the basis of his own system, and probably determined his choice of a profession. He adopted that of medicine, which however the weakness of his constitution prevented him from practising.

In 1664 Locke visited Berlin as secretary to Sir W. Swan, envoy to the elector of Brandenburg; but after a year he returned to Oxford, where he accidentally formed the acquaintance of Lord Ashley, afterwards earl of Shaftesbury. Locke accepted the invitation of this nobleman to reside in his house; and from this time he attached himself to his fortunes during life, and after death vindicated his memory and honour. (*Mémoires pour servir à la Vie d'Antoine Ashley, Comte de Shaftesbury, tirées des Papiers de feu M. Locke, et redigées par* Le Clerc, *Biblioth. Choisie*, t. vii., p. 146.) In the house of Shaftesbury Locke became acquainted with some of the most eminent men of the day, and was introduced to the earl of Northumberland, whom, in 1668, he accompanied on a tour into France. Upon the death of the earl, he returned to England, where he again found a home in the house of Lord Ashley, who was then chancellor of the exchequer, and Locke was employed to draw up a constitution for the government of Carolina, which province had been granted by Charles II. to Lord Ashley with seven others.

In 1670 Locke commenced his investigations into the nature and extent of the human understanding, but his numerous avocations long protracted the completion of his work. In 1672, when Ashley was created earl of Shaftesbury and made lord chancellor, Locke was appointed secretary of presentations. This situation he held until Shaftesbury resigned the great seal, when he exchanged it for that of secretary to the Board of Trade, of which the earl still retained the post of president.

In 1675 Locke was admitted to the degree of bachelor in medicine, and in the summer of the same year visited France, being apprehensive of consumption. At Montpelier, where he ultimately took up his residence, he formed the acquaintance of the earl of Pembroke, to whom he afterwards dedicated his 'Essay concerning Human Understanding.' In 1679 Locke was recalled to England by the earl of Shaftesbury, who had been restored to favour and appointed president of the council. Six months afterwards however he was again disgraced, and, after a short imprisonment in the Tower, was ultimately compelled to leave England in 1682, to avoid a prosecution for high treason. Locke followed his patron to Holland, where, even after the death of Shaftesbury, he continued to reside; for the hostility of the court was transferred to Locke, and notwithstanding a weak opposition on the part of the dean, his name was erased, by royal mandate of the 16th of November, 1684, from the number of the students of Christ Church. But the rancour of the court-party extended its persecution of Locke even into Holland, and in the following year the English envoy demanded of the States-general the delivery of Mr. Locke, with eighty-three other persons, on the charge of participating in the expedition of the duke of Monmouth. Fortunately Locke found friends to conceal him until either the court was satisfied of his innocence or the fury of persecution had passed away. During his residence in Holland he became acquainted with Limborch, Leclerc, and other learned men attached to the cause of free inquiry, both in religion and politics. Having completed his 'Essay concerning Human Understanding' in 1687, he made an abridgement of it, which was translated into French by Leclerc, who inserted it in one of his Bibliothèques. In that of 1686 he had already published his 'Adversariorum Methodus, or a New Method of a Common-place Book,' which was originally written in French, and was afterwards first published in English among his posthumous works. In the 'Bibliothèque' of 1688 appeared his Letter on Toleration, addressed to Limborch, which was soon translated into Latin, and published the next year at Gouda. On the Revolution of 1688, Locke returned to England in the fleet which conveyed the princess of Orange. In reward for his sufferings in the cause of liberty, Locke now obtained, through the interest of Lord Mordaunt, the situation of commissioner of appeals, with a salary of 200*l.* a-year. In 1690 his reputation as a philosophical writer was established by the publication of his 'Essay concerning Human Understanding,' which met with immense success. Independent of the merits of the work itself as an attempt to apply the Baconian method of observation and experience to establish a theory of human knowledge, many circumstances contributed to its success: among others, the personal celebrity of the author as a friend of civil and religious liberty, and the attempt made at Oxford to prevent its being read in the colleges, a measure which could not fail to have a contrary effect. Numerous editions passed rapidly through the press, and translations having been made of it into Latin and French, the fame of the author was quickly spread throughout Europe. In the same year Locke published a second letter on Toleration, in answer to an attack on his first letter by Jonas Proast, a clergyman of Queen's College, Oxford, as well as two treaties on Government. These essays were intended generally to answer the partisans of the exiled king, who called the existing government a usurpation, but particularly to refute the principles advanced in the 'Patriarcha' of Sir Robert Filmer, who had maintained that men are not naturally free, and therefore could not be at liberty to choose either governors or forms of government, and that all legitimate government is an absolute monarchy. The first essay is devoted to the refutation of the arguments by which Sir Robert supports these principles, and which are ultimately reduced to this, that all government was originally vested by God in Adam as the father of all mankind, and that kings, as the representatives of Adam, are possessed of the same unlimited authority as parents exercise over their children. In the second essay Locke proceeds to establish, what had been the leading dogma of the Puritans and Independents, that the legitimacy of a government depends solely and ultimately on the popular sanction or the consent of men making use of their reason to unite together into a society or societies. The philosophical basis of this treatise formed a model for the 'Contrat Social' of Rousseau.

The air of London disagreeing with Locke, who suffered from a constitutional complaint of asthma, he accepted the offer of apartments in the house of his friend Sir Francis Masham, at Oates in Essex, where he resided for the remainder of his life. In this retirement he wrote his third letter on Toleration, which called forth a reply from Locke's former antagonist on the subject; in answer to whom a fourth letter, in an unfinished state, was published after the death of Locke. In 1693 he first gave to the world his 'Thoughts upon Education,' to which likewise Rousseau is largely indebted for his 'Emile.' Though appointed one of the commissioners of trade and plantations in 1695, Locke still found leisure for writing. The treatise, which was published in this year, 'On the Reasonableness of Christianity,' was intended to facilitate the execution of a design which William III. had adopted to reconcile and unite all sects of professing Christians, and accordingly the object of the tract was to determine what, amid so many conflicting views of religion, were the points of belief common to all. This work being attacked by Dr. Edwards, in his 'Socinianism unmasked,' Locke published in defence of it a first and a second 'Vindication of the Reasonableness of Christianity,' &c. In 1697 Locke was again engaged in the controversy, in consequence of the publication of a 'Defence of the Doctrine of the Trinity,' by Stillingfleet, bishop of Worcester, in which the bishop had censured certain passages in the 'Essay concerning Human Understanding,' as tending to subvert the fundamental doctrines of Christianity. Against this charge Locke ably vindicated his Essay; and the controversy, after having been maintained for some time, was at length terminated by the death of Stillingfleet.

Locke's health had now become so impaired, that he determined to resign his office of commissioner of trade and plantations. He refused to receive a pension which was offered him, and which his services in the public cause had amply merited. From the time of his retirement he resided always at Oates, and devoted the remainder of his life to the study of the Holy Scriptures. Among others of his religious labours at this period, a 'Discourse on Miracles,' and 'Paraphrases, with notes, of the Epistles of St. Paul,' together with an 'Essay for the Understanding of St. Paul's Epistles by consulting St. Paul himself,' were published among his posthumous papers. These contained also the work, 'Of the Conduct of the Understanding,' and an 'Examination of Father Malebranche's opinion of Seeing all things in God.' He died on the 28th October, 1704, in the seventy-third year of his age.

The personal character of Locke was in complete harmony with the opinions which he so zealously and so ably advocated. Truly attached to the cause of liberty, he was also willing to suffer for it. Perfectly disinterested, and without any personal objects at stake in the political views which he adopted, he never deviated from modreation, and the sincerity of his own profession rendered him tolerant of what he believed to be the conscientious sentiments of others.

As a writer Locke has a happy facility in expressing his meaning with perspicuity in the simplest and most familiar language. Clearness indeed is the leading character of his composition, which is a fair specimen of the best prose of the period. His style however is rather diffuse than precise, the same thought being presented under a great variety of aspects, while his reasonings are somewhat prolix, and his elucidations of a principle occasionally unnecessarily prolonged. These are faults however which, though they may materially detract from the merits of his composition as a model of critical correctness, have nevertheless greatly tended to make his 'Essay concerning Human Understanding' a popular work.

A rapid analysis of this Essay is necessary to enable us to form a right estimate of the philosophical merits of Locke.

As all human knowledge ultimately reposes, both in legitimacy and extent, on the range and correctness of the cognitive faculty, which Locke designates by the term 'understanding,' Locke proposes to determine what objects our understanding is and is not fitted to deal with. With this view he proposes in the first place to inquire into the origin of ideas; in the next place, to show the nature of that knowledge which is acquired by those ideas, and its certainty, evidence, and extent; and lastly, to determine the nature and grounds of assent or opinion.

Before entering upon this investigation Locke gets rid of a supposition which, if once admitted, would render all such inquiry useless. The refutation of the theory of innate ideas and principles of knowledge is the subject-matter of the first book of the Essay. Generally, he observes, the common assent of men to certain fundamental principles may be explained otherwise than by the supposition of their being innate; and consequently the hypothesis is unnecessary. But, in particular, he denies that there are any such universal and primary principles as are admitted by all men, and known as soon as developed, for to these two heads he reduces all the arguments usually advanced in support of this hypothesis. Thus of speculative principles he takes the principles of contradiction and identity, and shows, by an inductive appeal to savages, infants, and idiots, that they are not universally acknowledged; and as to their being primary, he appeals to observation of the infant mind, as proving that they are far from being the first ideas of which the human mind is conscious. The principles of morals are next submitted to a similar examination; and lastly, he shows that no ideas are innate: for this purpose he selects the ideas of God and substance, which, by a like appeal to savage nations and children, he proves to be neither universal nor primary, and arrives at the conclusion that neither particular ideas nor general principles of knowledge or morals are antecedent to experience.

The only source of human knowledge is experience, which is two-fold, either internal or external, according as it is employed about sensible objects or the operations of our minds. Hence there are two kinds of ideas, ideas of sensation and ideas of reflection. Reflection might properly be called an internal sense. The latter are subsequent to the former, and are inferior in distinctness to those furnished to the mind through the sensuous impressions of outward objects. Without consciousness it is, according to Locke, impossible to have an idea; for to have an idea and to be conscious of it is the same thing. He accordingly maintains, at great length, against Descartes, that the mind does not always think, and that its essence does not consist in thinking.

Now all ideas, whether of sensation or reflection, correspond to their objects, and there is no knowledge of things possible except as determined by our ideas. These ideas are either simple, and not admitting of further reduction, or complex. The simple rise from the inner or outer sense; and they are ultimately the sole materials of all knowledge, for all complex ideas may be resolved into them. The understanding cannot originate any simple ideas, or change them, but must passively receive them as they are presented to it. Locke here makes the first attempt to give an analysis of the sensuous faculty, to refer to each of the senses the ideas derived from them separately, or from the combined operation of several. Thus light and colour are derived from vision alone, but extension and figure from the joint action of sight and touch. While the outer sense gives the ideas of solidity, space, extension, figure, motion, and rest, and those of thought and will are furnished by the inner sense, or reflection, it is by the combined operation of both that we acquire the ideas of existence, unity, power, and the like. In reference to the agreement of ideas with their objects, Locke draws an important distinction between primary and secondary qualities: the former belong really to objects, and are inseparable from them, and are extension, solidity, figure, and motion; the latter, which are colour, smell, sounds, and tastes, cannot be considered as real qualities of objects, but still, as they are powers in objects themselves to produce various sensations in the mind, their reality must in so far be admitted. Of the operations of the understanding upon its ideas, perception and retention are passive, but discerning is active. By perception Locke understands the consciousness or the faculty of perceiving whatever takes place within the mind; it is the inlet of knowledge, while retention is the general power by which ideas once received are preserved. This faculty acts either by keeping the ideas brought into it for some time actually in view, which is called contemplation or attention, the pleasure or pain by which certain ideas are impressed on the senses contributing to fix them in the mind; or else by repetition, when the mind exerts a power to revive ideas which after being imprinted have disappeared. This is memory, which is, as it were, the storehouse of ideas. The ideas thus often *refreshed*, or repeated, fix themselves most clearly and lastingly in the mind. But in memory the mind is oftentimes more than barely passive, the re-appearance of obliterated pictures or ideas depending on the will. Discerning, by which term he designates the logical activity of the intellect, consists in comparing and compounding certain simple ideas, or in conceiving them apart from certain relations of time and place. This is called abstraction, by means of which particular ideas are advanced to generals. By composition the mind forms a multitude of complex ideas, which are either modes, substances, or relations.

Locke then proceeds to show in detail how certain complex ideas are formed out of simple ones. The idea of space is got by the senses of sight and touch together; certain combinations of relations in space are measures, and the power of adding measure to measure without limits is that which gives the idea of immensity.

Figure is the relation which the parts of the termination of a circumscribed space have within themselves. He then proceeds to refute the Cartesian doctrine, that body and extension are the same; and maintains that while body is full, space is empty, and that all bodies may easily pass into it; and while the latter is not physically divisible, that is, has not moveable parts, the parts of the former are moveable, and itself is physically divisible. What however space is actually, is left undetermined. He asserts the existence of a vacuum beyond the utmost bounds of body, and this is proved by the power of annihilation and the possibility of motion. The idea of succession arises from the perception of a continued series of sensations, and by observing the distance between two parts of the series we gain the idea of duration, which, when determined by a certain measure, suggests that of time; and as we arrive at the idea of immensity by the perception that we can enlarge any given extension without limit, so the unchecked repetition of succession originates that of eternity. That of power is formed partly by a perception that outward objects are produced and destroyed by others, partly by that of the action of objects on the senses, but chiefly from that of the mind's internal operations. The latter suggests the idea of active power, the former of passive. Now the will is the power of producing the presence or absence of a particular idea, or to produce motion or rest, and liberty is the power to think or not, to act or not to act, according as appears good to the mind. The will is determined by the understanding, which itself is influenced by a feeling of the unfitness of a present state, which is called desire.

As to the origin of the idea of substance:—we often find certain ideas connected together; and in consequence of this invariable association, we conceive of them as a single idea; and as the qualities which originate these ideas have no separate subsistence in themselves, we are driven to suppose the existence of a 'somewhat' as a support of these qualities. To this somewhat we give the name of substance, and relatively to it all qualities are called accidents.

Of the ideas of relation, those of cause and effect are got from the observation that several particulars, both qualities and substances, begin to exist, and receive their existence, from the due application and operation of some other being. In the same manner the ideas of identity and diversity are derived from experience. When we compare an object with itself at different times and places, and find it to be the same, we arrive at the idea of identity. Whatever has the same beginning in reference to time and place is the same, and a material aggregate which neither decreases nor lessens is the same; but in organical and living creatures, identity is determined not merely by the duration of the material mass, but by that of the organical structure and the continuance of consciousness. Lastly, moral good and evil are relations. Good and evil are nothing but that which occasions pleasure and pain; and moral good and evil are the conformity of human actions to some law whereby physical good or evil is produced by the will and power of the law-maker. Law is of three kinds: divine law, which measures sin and duty; civil, which determines crime and innocence; and philosophical, or the law of opinion or reputation, which measures virtue and vice.

Having thus examined the origin and composition of ideas, Locke proceeds to determine their general characters. He divides them accordingly into clear and obscure, distinct and confused, into real and fantastical, adequate and inadequate, and lastly, into true and false. In treating of this last distinction, he observes that all ideas are in themselves true; and they are not capable of being false until some judgment is passed upon them, or, in other words, until something is asserted or denied of them. But there is also this property in ideas, that one suggests another, and this is the so-called association of ideas. There are associations of ideas which are natural and necessary, as well as arbitrary, false, and unnatural combinations. The danger of the last is vividly pointed out, which often arise from our having seen objects connected together by chance. Hence the association, which was originally purely accidental, is invariably connected in the imagination, which consequently biasses the judgment. Hence too a number of errors, not only of opinion but of sentiment, giving rise to unnatural sympathies and antipathies which not unfrequently closely verge upon madness. This gives occasion to a variety of judicious observations on the right conduct of education, the means of guarding against the formation of such unnatural combinations of ideas, and the method of correcting them when once formed, and of restoring the regular and due associations which have their ground in the very nature of the human mind and its ideas. What however are the leading laws of association Locke has not attempted to determine.

Before passing from this deduction of ideas to the examination of the nature and extent of the knowledge which is acquired by means of them, Locke devotes the third book of his Essay to the investigation of language and signs, which it is not important for our purpose to state.

Locke then proceeds to determine the nature, validity, and limits of the human understanding. All knowledge, strictly defined, is the perception of the agreement or disagreement of ideas, and is consequently limited to them. It extends therefore only so far as we are able to perceive the validity of the combinations and relations of our ideas, that is, so far as we are enabled to discover them by intuition, demonstration, and sensation. Intuition, which Locke calls an immediate perception of relation, does not apply to all ideas; many must be proved by means of some intermediate ideas. This is the province of demonstration, every step of which however is an act of intuition. Demonstration again does not apply to the proof of all ideas, since in the case of many no middle ideas can be found by means of which the comparison may be made. Sensation is still more limited, being confined to what is actually passing in each sense. Generally, all knowledge directs itself to identity or diversity, co-existence, relation, and the real existence of things. Identity and diversity are perceived by intuition, and we cannot have an idea without perceiving at the same time that it is different from all others. With regard to co-existence our knowledge is unlimited; for our ideas of substances are mere collections or aggregates of certain single ideas in one subject; and from the nature of these single ideas, it is impossible to see how far they are or not combinable with others. Hence we cannot determine what qualities any object may possess in addition to those already known to us. As to the actual existence of things, we have no intuitive knowledge thereof, except in the case of our existence; that of God is demonstrative, but of all other objects we only sensuously know that they exist, that is, we perceive mediately by sensation their existence or presence.

Locke next passes to an examination of propositions, axioms, and definitions. The utility of axioms is denied on the ground that they are not the only self-evident propositions, and because equal if not greater certainty is contained in all particular identical propositions and limited cases. Moreover they do not serve to facilitate knowledge, for all particular propositions will find a more ready assent; as, for instance, the proposition, twice two are four, will be more easily admitted than that the whole is equal to its parts. Moreover axioms are not useful for the proof of all lower propositions involved in them; they cannot consequently form the basis of any science: for example, no science has ever been raised on the basis of the principle of contradiction. They do not even contribute to the enlargement of knowledge; the false as well as the true may be proved by them, and consequently they serve at best but for endless dispute. Among these barren and unprofitable propositions, Locke reckons not merely those that are identical, but analytical also, or those in which a property contained in a complex idea is predicated of it: *e.g.* Every man is an animal. By such judgments or propositions we learn in fact nothing, and our knowledge is not increased in the least degree. Knowledge can only be extended by such judgments as predicate of a subject some quality or property which is not already involved in the idea of it. Synthetical propositions therefore are alone of value. In the next place he examines certain metaphysical problems, and concludes of most of them that they do not admit of any precise solution, while others might easily be set at rest if men would only come to the investigation of them free from all prejudices. Some very valuable remarks are added upon the sources of error, and on enthusiasm and faith, the due limits of which are pointed out, and the important truth repeatedly insisted upon, that reason is the ultimate test of revelation. The work concludes with a division of the object-matter of science or knowledge, which he makes to be threefold. 1, Natural philosophy, or physica, which is the knowledge of things both corporeal and spiritual. The end of this is speculative truth. 2, Ethics, or practica, which is the skill of rightly applying our powers and actions for the attainment of things good and useful, the end of it being not bare speculation, but right, and a conduct suitable to it. 3, The doctrine of signs (σημειωτική), the business of which is to consider the nature of the signs which the mind makes use of for the understanding of things or the conveying of its ideas to others. This is the most general as well as most natural division of the objects of the understanding. For man can employ his thoughts about nothing but either the contemplation of things for the discovery of truth; or about the things in his own power, which are his own actions for the attainment of his ends; or the signs which the mind makes use of in both, and the right ordering of them for its information.

Such is the celebrated Essay which has formed the basis of more than one school of modern philosophy, whose very opposite views may indeed find some support in the occasional variations and self-contradictions of its author. For it must be admitted that it is deficient in that scientific rigour and unity of view which preclude all inconsistency of detail. Nevertheless, rightly to appreciate Locke's philosophical merits, all contradictory passages must be neglected, or interpreted by the general spirit of his system. Attaching our attention then to the common mould and whole bearing of the Essay, we must conclude that the authority of Locke is unduly claimed by the followers of Condillac and the ideologists of France, whose object it was to approximate as closely as possible the rational thought and sensuous perception, and to explain the former as simply a result of the latter. For although Locke took in hand the defence of the sensuous element of knowledge, and, in opposition to Descartes and the idealists, endeavoured to show that in the attainment of science we set out from the sensible as the earlier and the better known, still he was far from denying that the rational thought, which is the perfection of human cognition, is really and truly distinct from the motions of the mind or soul occasioned by sensation. Setting out with the assumption of the permanence of ideas in the mind, Locke proceeds to illustrate the development of the particular into the general; and having then shown their difference from the unreal creations of the fancy, proceeds to determine their degree of verity. This description of the advance from the simple idea to universals and to knowledge, evidently implies an independent and spontaneous activity of the mind, which assents to the sensuous impressions, and confirms them by its conviction. Locke therefore is far from looking upon human science and knowledge as the simple results of the impressions produced by external objects on the senses. Nevertheless there is another aspect of his theory which in some degree justifies the use which has been made of his name, and under which he appears to be proceeding in the direction of thought, of which the ideologists have attained to the height. Knowledge as well as sensation is looked upon as the joint result of the reciprocal action of outward objects and the mental faculties, wherein as much depends on the qualities of the external as on those of the internal. While he admits that assent is entirely subjective, he nevertheless grants that outward objects constrain it; and as a consequence of such a view, he teaches that notwithstanding the idea produced in the mind by an outward object be a passive affection of the mind, it nevertheless reveals to the mind its efficient cause; and that to this manifestation of outward objects by the senses there is invariably attached, as by a necessary consequence, the judgment that those objects exist really. It is therefore clear that, according to Locke, we receive from the senses not merely the object matter of knowledge, but that likewise the forms under which we conceive of objects are furnished to the mind from the same source.

The works of Locke have been collected and frequently published in 3 vols. fol., and a Life of him was written in 1772; but the most complete and best edition is that in 10 vols. 8vo., London, 1801 and 1812. A Life of Locke was published in 1829, by the late Lord King, a lineal descendant of his sister.

LOCKED JAW. [TETANUS.]

LOCKEREN, a town of East Flanders, in 51° 8′ N. lat. and 3° 58′ E. long., distant 6 miles north-west from Dendermond, and 10 miles east-north-east from Ghent, on the high road from that city to Antwerp. On the 1st of January, 1831, the population of the town amounted to 16,069 souls, and the number of houses to 2378. Several of the streets are regular and well built; the market-place is large, and surrounded by excellent houses. There is a large and commodious hospital, built in 1829, with funds chiefly contributed by three private citizens, one of whom gave the ground upon which it stands. Besides the parish church there are three chapels, a handsome town-hall, an orphan asylum, a prison, and seven communial and nine private schools.

Lockeren is a place of considerable trade, and contains many and various manufactories. Among the fabrics which are produced are cotton, linen, and woollen cloths, cotton hosiery and yarn, lace, sail-cloth, hats, and cordage: there are also many breweries, dye-houses, tanneries, and salt-refineries. A market is held every Wednesday, at which considerable quantities of farming produce are sold.

LOCRIS was employed to designate the country of three distinct Grecian tribes, the Locri Epicnemidii, the Locri Opuntii, and the Locri Ozolæ.

The Locri Epicnemidii and Locri Opuntii, who appear to have been more antient than the Locri Ozolæ, since the latter are not mentioned by Homer, inhabited the eastern coast of Phocis, and were separated from the latter country by a mountain range which stretches from Mount Œta to the borders of Bœotia. The northern part of this range, which is much higher than the southern, was called Cnemis, whence the Epi-cnemidii Locri derived their name. The Opuntii Locri derived their name from Opus, their chief town, on the borders of Bœotia.

The Locri Ozolæ were bounded on the west by Ætolia, on the north by Doris, on the east by Phocis, and on the south by the Corinthian Gulf. According to Strabo (ix., p. 427) they were a colony from the Eastern Locri. The origin of their name is uncertain; none of the etymologies given by Pausanias (x. 38) and Strabo (ix. 427) appear to be satisfactory. The inhabitants of the Western Locris are said by Thucydides (i. 5) to have been a wild and barbarous people even in the time of the Peloponnesian war; and in their manners and customs they appear to have resembled their neighbours the Ætolians. The principal towns of western Locris were Amphissa and Naupactus. Amphissa (Salona), an inland town at the head of the Crissæan Gulf, was destroyed by order of the Amphictyons, B.C. 338, for cultivating the sacred ground of Crissa. It was afterwards rebuilt, and in the war with the Romans, B.C. 190, it is mentioned by Livy (xxxvii. 5) as a place of considerable importance. Amphissa is said by Æschines (*Ctes.*, c., 39) to have been 60 stadia from Delphi, and by Pausanias (x., 38, sec. 20) 120 stadia. The real distance, according to Sir W. Gell, is seven miles. Naupactus (Nepakto, or Lepanto), on the sea-coast on the borders of Ætolia, was for a long time in the possession of the Athenians, who established there, in B.C. 455, at the close of the third Messenian war, those Messenians who quitted Ithome. On the termination of the Peloponnesian war it fell into the power of Sparta, and in later times was subject to the Ætolians.

The Leleges appear to have been the earliest population of Eastern Locris (Strabo, vii. 321); but the country was also inhabited in very early times by some tribes of the Hellenic nation, probably by Æolians. The Opuntii pretended that they were the most antient Hellenic people in Greece; and that Cynus, their port, had been inhabited by Deucalion, when he first descended from Parnassus (Strabo, ix. 425).

The Locri Epizephyrii, or Western Locri, who inhabited the south-eastern extremity of Italy, were a colony, according to Ephorus, of the Locri Opuntii, but according to Strabo of the Locri Ozolæ. It would appear from a statement in Pausanias (iii. 3, sec. 1) that the Spartans took a part in the foundation of this colony. An account of the political constitution of the Locri Epizephyrii is given in Müller's *Dorians* (ii., p. 243, English transl.). The time of the foundation of this colony is uncertain; according to some accounts it was founded B.C. 710, and according to others B.C. 683. The Locri Epizephyrii are said to have been the first Greek people who had a written code of laws (Strabo, vi., 397), which was drawn up by Zaleucus about B.C. 664.

Coin of Locris.
British Museum. Actual size. Silver.

LOCUS. This word, or the Greek τόπος, signifying simply *place*, was used by the first geometers to denote a line or surface over which a point may travel, so as always to be in a position which satisfies some given condition. Thus, suppose it required to find the position of a point at which a given line subtends a right angle: the answer is, that the number of such points is infinite; for that any point whatsoever upon the surface of a sphere which has the given line for its diameter is such a point as was required to be found. This would be expressed as follows:—the *locus* of the point at which a given line subtends a right angle, is the sphere described on the given line as a diameter. If however the point were required to be in a given plane, its locus would no longer be the whole sphere, but only that circle which is the common section of the sphere and the given plane.

The following assertions are really nothing more than common propositions of geometry, stated in such a manner as to introduce the term locus. (1.) The locus of the vertex of an isosceles triangle described upon a given base is the straight line which bisects the base at right angles. (2.) The locus of the vertex of a triangle which has a given base and a given area is a pair of straight lines parallel to, but on different sides of, the base. (3.) The locus of the vertex of a triangle which has a given base and a given vertical angle, and which lies on a given side of the base, is an arc of a circle of which the given base is the chord; and so on.

The geometrical analysis of the Greeks depended much upon the investigation of loci, and the method of using them will sufficiently appear by one instance. Suppose, for example, it is required to describe a triangle of given area and given vertical angle upon a given base. Laying down the given base, it is easy to draw the parallel which is the containing line, or locus, of the vertices of all the triangles which have the given area; and also, upon the same side, the arc of the circle which is the locus of the vertices of all the triangles having the given vertical angle. If then the parallel and the arc of the circle intersect, the point or points of intersection are obviously the vertices of triangles which satisfy all the required conditions; if they do not intersect, the problem is impossible. When the locus of all the points satisfying a given condition cannot be ascertained by elementary geometry, and when this locus is therefore taken for granted, we have the species of solution which was called *mechanical*. An instance of this will appear in the article TRISECTION OF THE ANGLE.

It is to be understood that no curve whatever is called the locus of a point, unless any point whatsoever of that curve may be taken as the point in question. Thus, if each of six points should satisfy certain conditions, all lying upon a given circle, and if no other point of the circle should satisfy those conditions, that circle would not be called the locus of the points.

LOCUST. The terms Locust and Grasshopper are applied to various insects of the order Orthoptera, and belonging to a section of that order to which Latreille applies the name *Saltatoria*, on account of the power of leaping which the species possess. The insects belonging to this section are remarkable for the great size of the thighs of the posterior pair of legs, which are generally very long, and adapted for leaping. The males of some of the species make a shrill sound by the friction of the elytræ. The part by which the sound is created is situated on the inner side and near the base of each elytra, is often transparent, and has been compared to a piece of talc. In other species the sound is produced by the friction of the thighs against the elytra.

The section *Saltatoria* contains three families, to which the names *Achetidæ*, *Gryllidæ*, and *Locustidæ* are applied by Dr. Leach. The family *Achetidæ* is thus defined:—Elytra horizontal; wings longitudinally folded, often produced beyond the elytra; tarsi three-jointed. This family contains the genera Gryllotalpa of *Ray, Leach,* and others, of which the mole-cricket (*G. vulgaris*) of this country affords an example, and *Acheta* of Fabricius, which is the Gryllus proper of the 'Règne Animal.' The common cricket in our houses (*Acheta domesticus*) belongs to this genus. The genera *Tridactylus* and *Myrmecophila* are also included in the present family. In the family *Gryllidæ* the wings are disposed in an oblique manner when folded, the tarsi are four-jointed, the antennæ are long and setaceous, and the oviduct is exserted in the female, of a long and compressed form, and recurved.

The insects of this family form the genus *Locusta* of the 'Règne Animal.' The *Acrida viridissima* is the largest among the British species of the present group. This insect is not uncommon in some parts of England, and is about two inches in length and of a bright green colour.

The family *Locustidæ* is distinguished by the following characters:—Wings when folded meeting at an angle: tarsi three-jointed; antennæ filiform or ensiform; oviduct not exserted. The Locustidæ of Dr. Leach are comprised in the genus *Acridium* by Latreille. Unfortunately there is much confusion as regards the names of some of the genera and subgenera contained in this as well as the other families above noticed. Names originally applied to large groups are restricted to smaller sections, and as entomologists differ in opinion as to which particular division shall retain the original name, the same names are used to designate different groups; hence the references made to Latreille's portion of the 'Règne Animal.'

The principal genera contained in the family *Locustidæ* are:—

Locusta (Leach), in which the hinder legs are about equal to the whole body in length, and the antennæ filiform or terminated in a club. Upwards of twenty species of this genus are enumerated by Mr. Stephens in his 'Catalogue of British Insects,' and it is to this group that the *Gryllus migratorius* of Linnæus belongs, a large species, which has occasionally been found in Britain, and which in some parts of Europe sometimes multiplies to such a degree as to devastate large districts. Africa at all times appears to have been peculiarly subject to the ravages of these insects: of their extraordinary devastations in this portion of the globe we have records from the earliest authors, and the works of the most recent travellers confirm them. Mr. Barrow, in his 'Travels,' states, 'that in the southern parts of Africa an area of nearly two thousand square miles might be said literally to be covered with them. When driven into the sea by a north-west wind, they formed upon the shore for fifty miles a bank three or four feet high, and when the wind was south-east the stench was so powerful as to be smelt at the distance of 150 miles.' In Messrs. Kirby and Spence's 'Introduction to Entomology' numerous accounts of a similar nature will be found. In some parts of Africa they are cooked and eaten by the natives. The natives of Senegal are said to dry them, and having reduced them to powder, use them as flour.

Genus *Gomphocerus* (Leach). Hinder legs exceeding the body in length; antennæ capitate, having a spoon-shaped club in both sexes; anterior tibiæ simple. This genus contains numerous species, six or seven of which are found in England. They are usually of small size, and, together with the smaller species of the preceeding genus, are commonly called grasshoppers.

Genus *Acrydium* (Leach). The species of this genus may be distinguished by the large size of the scutellum, which is produced posteriorly and covers the wings. They are found on hot sandy banks.

The genus *Pneumora* (Thunb.) has been established for the reception of certain African Locustidæ, which have a membranous pellet between the terminal hooks of the tarsi, the antennæ filiform, the posterior legs shorter than the body, and the abdomen vesicular—at least in one of the sexes.

The genus *Proscopia* of Klug contains numerous apterous species peculiar to South America, in which the body is long and cylindrical, the head destitute of ocelli and prolonged anteriorly, the antennæ short and filiform, the posterior legs long, and approximated to the intermediate pair, which are remote from the anterior pair.

LOCUST TREE is the Robinia Pseudacacia of botanists, a North American forest-tree. [ROBINIA.] The same name has also been given to the Ceratonia Siliqua, or Carob or Algaroba tree, which inhabits the Levant, and bears large pods, filled with nutritious pulp.

LOCUSTA (Crustaceology). [PALINURUS.]

LODDON. [BERKSHIRE.]

LODEVE, a town in France, capital of an arrondissement, in the department of Hérault, on the road from Paris to Narbonne, Perpignan, and Barcelona. This town is noticed by Pliny, who calls the townsmen Lutevani. In the later Roman documents the name appears to have been corrupted to Loteva, whence the name Lodève. It was included in the Roman province of Narbonensis Prima. In the middle ages it was the seat of a vicecounty: but in the crusade against the Albigenses the bishops of Lodève became lords of the town, and remained so till the French revolution. The bishopric (now suppressed) was established in the fifth century: the bishop was a suffragan of the archbishop of Narbonne. The town stands in a pleasant valley amid the lower slopes of the Cévennes, on the left bank of the Lergue, a small feeder of the Hérault. It is surrounded by antient walls; the streets are narrow, and the houses ill built. The population in 1831 was 9834 for the town. or 9919 for the whole commune; in 1836 it had increased to 11,208 for the commune. The chief manufacture is that of coarse woollen cloths; hats, leather, earthenware, and soap are made; olive oil is pressed, and brandy distilled. Quarries of grey and white gypsum are worked in the neighbourhood. There are several judicial or fiscal government offices, an Agricultural Society, and a high school. Cardinal Fleury was born here.

The arrondissement of Lodève has an area of 474 square miles, and is subdivided into 72 communes; the population was 55,911 in 1831; in 1836 it was 57,730.

LODI, PROVINCIA DI LODI E CREMA, one of the provinces of the Lombardo-Venetian kingdom, is bounded on the north by the provinces of Milan and Bergamo, on the west by that of Pavia, on the south by the Po, which divides it from the duchy of Parma and Piacenza, and on the east by Cremona and Brescia. The province is part of the great plain of the Po, and is watered by the Adda, Serio, Lambro, and other affluents of that river. This province was divided into two small ones until the end of the last century, which were separated by the Adda, namely, Crema to the east of that river, which belonged to the republic of Venice, and Lodi west of the Adda, which was part of the duchy of Milan.

The actual province of Lodi and Crema is thirty miles in length from east to west, from the river Oglio near Orzinovi to the river Lambro near Melegnano; and above twenty-seven miles from north to south, from the southern boundaries of the province of Bergamo to the bank of the Po opposite Piacenza. It is divided into eight districts, namely, 1, Lodi, with 22 communes, 1935 houses, and 28,670 inhabitants; 2, Telobuonpersico, 29 communes, 1320 houses, and 12,326 inhabitants; 3, Sant' Angelo, 17 communes, 1582 houses, and 15,037 inhabitants; 4, Borghetto, 19 communes, 1842 houses, and 19,425 inhabitants; 5, Casal Pusterlengo, 21 communes, 2353 houses, and 28,263 inhabitants; 6, Codogno, 24 communes, 4534 houses, and 38,952 inhabitants; 7, Pandino, 15 communes, 1970 houses, and 15,474 inhabitants; 8, Crema, 50 communes, 5498 houses, and 45,888 inhabitants. The soil is partly sown with corn and pulse, and partly planted with the vine and mulberry-trees; but the best part consists of artificial meadows, irrigated by canals, which feed numerous cows, from the milk of whic the rich cheese is made, known in Lombardy by the nam of Lodigiano, but which, by an old misnomer, is called i Southern Italy and the rest of Europe by the name of Pa mesan. The annual produce is stated at 14,817 cwts. flax, 1,028,997 cwts. of hay, 6402 cwts. of cheese, 2187 cw of butter, 4384 cwts. of silk cocoons, besides corn and wi The number of cattle is stated at 36,046 heads of l cattle, 10,070 horses, 1135 asses and mules, 1338 sheep, 15,523 pigs. (*Carta Topografica della Provincia di e Crema*, published by G. B. Orcesi of Lodi, with Stati *Tables*, 1833.)

LODI, the capital of the province, situated on th road from Milan to Southern Italy, is a well-built town on the right bank of the Adda, in a rich country: it is a bishop's see, and a place of considerable trade, and has 15,890 inhabitants, with manufactories of pottery and delft-ware, and silks. Crema, on the right bank of the river Serio, is smaller than Lodi, has 8670 inhabitants, manufactures of linens, and a fine stud for the improvement of the breed of horses in Lombardy. Lodi has a royal lyceum and a gymnasium, besides a clerical seminary, and a house for female education, founded by Mrs. Cosway, the widow of the English artist of that name. There is also a house of industry for paupers, an orphan asylum, two hospitals, and a Monte di Pietà. The sums spent annually by these establishments for the relief of the poor amount to 259,000 Italian livres, or about 10,400*l.* sterling. The savings' bank of Lodi, which was opened in 1823, had, at the close of 1837, a deposit of 300,000 Italian livres, about 12,000*l.* sterling. In every commune there is a school of elementary instruction, as in the rest of Lombardy.

LOFODEN ISLANDS. [TRONDHEIM.]

LOG and LOGLINE. This is the apparatus by which the velocity of a ship's motion through the water is measured. If at any moment a piece of wood, or other light substance, be thrown out of a ship while sailing, as soon as it touches the water it ceases to partake of the ship's motion; the ship goes on, and leaves it behind. If then after a certain interval, say of half a minute, the distance of the vessel from the floating body be accurately measured, the rate of the ship's motion through the water will be ascertained; we do not say the actual rate of the ship's going, but only that of its motion through the water, because in many cases currents exist, and the wood itself is carried along; consequently the true rate cannot thus be known.

This is the principle of the log: in practice the log is a flat piece of wood, sometimes shaped like a fish, but more generally of the figure of a quadrant, loaded with lead at one of its edges to make it float upright; to this is attached a line about 150 fathoms long, divided into equal lengths by little pieces of knotted twine rove into it. These divisions begin about twenty or thirty yards from the log, where a piece of red rag is usually fastened, in order to show the place readily. All the line between the log and the rag is called the stray line, and is of course omitted from the account. When the log is thrown into the sea, which is done from the lee quarter of the vessel, the logline, by the help of a reel on which it is wound, is immediately veered out, at least as fast as the ship sails; as soon as the red rag leaves the reel, a half-minute glass is turned, and when the sand is all run down, the reel is stopped. Then by measuring the quantity of line run out, the distance sailed by the vessel in half a minute is known, and by calculation its rate of going per hour. There are various ways of dividing the line, the most usual of which is to place the knots at distances of fifty feet from each other; now as 120 times half a minute make an hour, and 120 times fifty feet make almost a geographical mile, so many knots will run from the reel in one experiment as the vessel sails miles in the hour; from this comes the expression of a vessel's sailing so many knots an hour—meaning miles. Fifty-one feet would be more accurately 120th part of a mile than fifty feet; but it is found practically that the ship's way is always a little more than that given by the log, arising from the circumstance that the line is unavoidably pulled in some degree, and the log is consequently not a fixed point; it is moreover safer to have a ship behind the reckoning than before it, which induces many commanders to shorten the distances between the knots to forty-eight and even forty-five feet. Whatever distance be taken, it is found convenient to subdivide it into ten parts for decimals of a mile. Careful commanders remeasure the log-line frequently, to ascertain if it varies from its original length. In case of an alteration they apply a correction to the rate found by a common process in the rule of three—as the length which the commander reckons upon is to the real interval, so is the apparent rate to the true rate. A similar correction is required if the half-minute glass is found to be wrong.

In the best regulated vessels the log is hove every hour; and in calculating the ship's going it is supposed that the rate has not varied between the intervals of heaving; but if the wind has sensibly varied, or more or less sail has been set during the time, then an allowance is made according to the discretion of the person who keeps the account.

About twelve years ago a very curious log was invented by Mr. Hookey, which though ingenious was too complex to come into general use; its object was to afford as great a resistance as possible to the pull of the line, and at the same time to be easily drawn back to the ship when its work was done. This log is shaped like a fish, and the line is in its mouth.

A more practically useful suggestion of Mr. Hookey was to soak the line in a mixture of three parts linseed oil and one part fish oil, which prevented its shrinking; a matter of no small importance when it is considered that a new line without preparation will lose 50 or 60 feet of its length by contraction when wetted.

All histories of mechanical invention will be found to contain suggestions for improving the mode of taking a ship's reckoning, some of which are worth a trial; but, so far as we are aware, the old log is invariably adhered to.

LOG-BOARD and LOG-BOOK. These contain the account of the ship's progress as deduced from observations of the log. The log-board is either a large piece of plank, blackened, ruled, and prepared for writing on with chalk, or else a slate with divisions scratched upon its surface. As soon as the seaman has hove the log, and the rate of motion is ascertained, the number of knots, with the odd tenths, are written on the board, each in its proper ruled column; also the course of the vessel, the direction of the wind, and any remarks made at the moment. This is repeated every time the log is hove, and once in twenty-four hours the whole is copied into a blank book called the log-book, which is ruled for the purpose in the same way as the log-board, and in which also all the transactions relative to navigation are inserted, such as bearings and distance of lands, rocks, and shoals, the direction and velocity of currents, and the state of the weather. It is also usual to set down every day the whole course and distance run, calculated from the results of all the several trials made by the log, with the distance and bearing of some port to which the ship is approaching. The account thus obtained is technically termed dead reckoning, and is never quite correct, being subject to all the errors caused by changing the direction and velocity in the intervals of observing, by the sort of guess usually made at the course and rapidity of currents, and at the amount of the falling off of the vessel from its apparent course, technically called lee-way. The dead reckoning is however necessarily used until an opportunity is afforded of taking observations for latitude and longitude, or until some place whose position is known comes in sight; the true place of the ship is then substituted in the log-book for that obtained by dead reckoning, and from that place subsequent reckonings are made until another observation.

Log-books are commonly sold in seaports, properly ruled for recording the events of a voyage. Although, strictly speaking, the log-book is confined to these objects, it is usual to include under the same appellation the whole of the ship's journal, or diary of occurrences.

LOGARITHMS. The etymology of this word is λογῶν ἄριθμος, *the number of the ratios*; and the reason for the appellation will appear in the course of this article. We assume that the reader has the common knowledge of logarithms, and of the method of using them.

We have abandoned the intention of giving a view of the rise and progress of logarithms, for the following reasons. The subject is now one of such wide extent, when its theory and practice are both included, that it would be like writing the history of a complete science to put together all that would be needed in an article professing to show the past and present state of logarithmic algebra, as well as of logarithmic computation. If we were to confine ourselves to the latter only, the view of the subject would be too confined. And since the elements of the subject now usually given are clothed in the most modern algebraical form, it would take considerable space to explain at length the processes of the early writers in terms intelligible to those who are not conversant with their writings. We shall therefore devote the first part of this article to such explanations as will enable the student, fresh from modern books of algebra, to read the various histories which exist with facility; and we shall then point out how to deduce the principal formulæ connected with logarithms.

The early history of logarithms will be found at length in the preface to Dr. Hutton's Tables; in the 'History of Logarithms' contained in the first volume of Dr. Hutton's

Tracts; in Delambre's 'Histoire de l'Astronomie Moderne,' vol. i., pp. 491-568. See also NAPIER, BRIGGS, GUNTER, KEPLER, MERCATOR, &c.

The idea of logarithms originally arose (in the mind of Napier) from the desire to make addition and subtraction supply the place of multiplication and division. A table, in which are registered 1, a, a^2, a^3, &c., supplies this desideratum to a certain extent; for since a^x multiplied by a^y gives a^{x+y}, we find the product of the two first by adding their exponents, and looking in the table for the $(x+y)$th power. Thus for the set 1, 2, 4, 8, 16, &c., a table of logarithms is easily constructed, a specimen of which is as follows:—

Num.	log.	Num.	log.	Num.	log.
1	0	32	5	1024	10
2	1	64	6	2048	11
4	2	128	7	4096	12
8	3	256	8	8192	13
16	4	512	9	16384	14

Thus, to multiply 64 and 128, that is, to find the product of the sixth and seventh powers of 2, we must take the (6+7)th or 13th power, which, from the table, is 8192.

Such a table would be useless for general purposes, since it omits more numbers than it contains. But if we take a very little greater than unity, the powers will increase but slowly, and every whole number within given limits may be made either a power of a, or very near to a power of a. Suppose for instance that we wish for a table of logarithms which shall contain among its numbers either every whole number under a million or a fraction within h of every number under a million. Extract the square root of one million, the square root of that square root, and so on, until, say the rth root of one million has been extracted, and let this rth root be $1+t$. It is obvious that this extraction may be carried on until t is small as we please. Consequently $(1+t)^r$ is a million, and every lower power of $1+t$ is less than a million, so that (m standing for a million) no two consecutive powers differ by so much as the difference of m and $m\,(1+t)$, or by so much as mt. If then we proceed with the extraction until mt is less than h, we shall have t of the degree of smallness required: that is, since every whole number less than m lies between two powers of $1+t$, having exponents less than r, *à fortiori* every such whole number must be within h of some power of $1+t$.

This is in fact the first view which was taken of the method of constructing tables of logarithms; and it must be remembered that Napier was not in possession of the modern way of expressing the powers of quantities. On the methods of facilitating such enormous computations, and on the details which still remained for the first calculators after they had applied all the analysis which they had, we have not here to speak; but we shall now show how the table may be formed by mere labour, and how the word logarithm arises.

Let us suppose that our system is to be such that 0 being the logarithm of 1, a hundred thousand shall be the logarithm of 10. If the hundred-thousandth root of 10 be extracted and called $1+t$, it would be found that 2 is very nearly the 30103rd power of $(1+t)$, that 3 is very nearly the 47712th power of $1+t$, and so on. If then, beginning with 1, we increase it in the ratio of 1 to $1+t$, giving $1+t$; if we increase this in the ratio of 1 to $1+t$, giving $(1+t)^2$, and so on, it appears that we shall reach 2 (or very near to it, one way or other), when 30103 such ratios have been taken; or if we pass from 1 to 10 by 100,000 steps, increasing each time in the same ratio, we shall come nearest to 2 in 30103 steps, which is therefore the number of times the increase is made in a certain ratio, or the number of the ratios, the λογῶν ἄριθμος, or the logarithm of 2.

In such a table it must of course follow that the logarithm of a product is exactly or very nearly the sum of the logarithms of the factors, since for instance 2 being $(1+t)^{30103}$ and 3 being $(1+t)^{47712}$ very nearly, 6 must be very nearly $(1+t)^{77815}$. Nor is this property altered, if we divide or multiply all the logarithms by the same number. If then we divide every logarithm by 100000, the logarithm of 10 becomes 1, that of 2 becomes ·30103, and that of 3 becomes ·47712, as in the common tables.

The first step of importance which was made in the logarithmic analysis was the following. If t be very small, the lower powers of $1+t$, the square, cube, &c., are $1+2t$, $1+3t$, &c., very nearly; or if m and n be not so great but that mt and nt are still small, the mth and nth powers of $1+t$ are $1+mt$ and $1+nt$ very nearly. But the logarithms of these powers are m and n; that is, if k and l be small, the logarithms of $1+k$ and $1+l$ are very nearly in the proportion of k to l. If then we take two numbers, a and b, and extract a very high root (say the rth) of both, so that the results are very near to unity, say $1+k$ and $1+l$, we have (nearly)

$$\log.\sqrt[r]{a} : \log.\sqrt[r]{b} :: k : l.$$

But the two first terms are in the same ratio as log a : log. b, since the multiplication of the former terms by r gives the latter. Consequently, when the logarithm of one number is known, that of any other can be found to any degree of nearness. We shall presently see this in a clearer form; it is sufficient here to show how the theorem was first obtained. If to the preceding methods we add that of INTERPOLATION, which Briggs used with success, we have before us the bases of the original computations of logarithms.

It was evident from the first that the connection between a logarithm and its number must be of the following kind: when the logarithm increases in arithmetical progression, the number must increase in geometrical progression; so that if a and $a+b$ be the logarithms of A and AB, then $a+2b$, $a+3b$, &c., must be the logarithms of AB^2, AB^3, &c. Several mathematicians had formed this conception; but the preliminary difficulty which stopped their progress was their being unable to present the series of natural numbers (or fractions of a high degree of nearness to them), in the shape of terms of a geometrical progression. The great merit of Napier is threefold: first, he distinctly saw that all numbers, within any given limit, may be either terms, or as near as we please to terms, of a geometrical progression; secondly, he had the courage to undertake the enormous labour which was requisite for the purpose; thirdly, he made an anticipation of the differential calculus in developing the primary consequences of the definition.

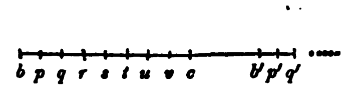
The predecessors of Napier probably did not well understand the notion of a quantity varying in geometrical ratio, while another varied simultaneously, but in an arithmetical ratio. The difficulty is that which a beginner finds in seizing the notion of compound interest carried to its extreme limit, so that every fraction of interest, however small, begins to make interest from the moment it becomes due. We have preferred to omit this consideration in the article INTEREST, where it would have been of no practical use, and to introduce it here, where it may aid in the explanation of the first principles of logarithms.

Let £1 become £$(1+r)$ in a year, and consequently, at the same rate of interest, it becomes £$(1+r)^n$ in n years. Suppose however that interest, instead of being payable yearly, is paid z times in a year, and that interest makes interest from the moment it is paid. Consequently, at the end of the first, second, &c. fractions of a year, the pound first put out becomes

$$1+\frac{r}{z},\ \left(1+\frac{r}{z}\right)^2,\ \left(1+\frac{r}{z}\right)^3 \ldots$$

or $\left(1+\frac{r}{z}\right)^z$ at the end of one year, and $\left(1+\frac{r}{z}\right)^{nz}$ at the end of n years.

If we may make z as great as we please, that is, if we may make payments of interest follow one another as quickly as we please, we may make the increase of the pound approach as nearly as we please to a gradual increase, of which it must be the characteristic that in successive equal times the amounts are in geometrical progression. Let A B become A C in a time represented by bc. Divide bc into any number of equal parts, and in the successive equal times bp, pq, qr, &c., let a point move through B P, P Q, Q R, &c. In the article ACCELERATION is explained the manner in which a succession of impulses, sufficiently small in amount, and often repeated, may be made to give, as nearly as we pleas

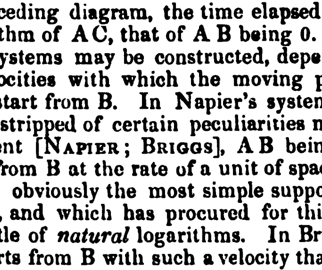


the results of a perfectly gradual motion. At B let a velocity be given sufficient to carry the point to P in the time *bp*; at P let an impulse be given which would cause P Q to be described in the time *pq*, and so on. And let A B, A P, A Q, &c. be a continued set of proportionals, namely, AB : AP :: AP : AQ :: AQ : AR, &c. Increase the number of subdivisions of *bc* without limit, and we approach as a limit to gradual motion of such a kind that the distances of the point from A, at the end of *any* successive equal times, shall be in continued proportion. To show this, suppose we compare the motion from B to C with any other part of the motion described in some subsequent time *b′c′* (equal to *bc*), and which carries the moving point from B′ to C′. Divide the time *b′c′* into as many equal parts, *b′p′*, *p′q′*, &c., as before, and let B′P′, P′Q′, &c. be the lengths described in the second set of subdivisions. Then by the law of the motion AB : AP :: AB′ : AP′, whence BP and B′P′ are in the ratio of AB to AB′; and similarly PQ and P′Q′ are in the ratio of AP to AP′, that is, of AB to AB′; and so on. Consequently, the sum of BP, PQ, &c., or BC is to the sum of B′P′, P′Q′, &c., or B′C′, in the same ratio of AB to AB′; whence also AC is to AC′ as AB to AB′, or AB : AC :: AB′ : AC′. That is, if in any one time the distance from A increases from X to Y, and in any other equal time from X′ to Y′, then X : Y :: X′ : Y′. From which it readily follows that the distances attained at the ends of successive equal times are in continued proportion.

More than this, the velocities of the moving point at B and B′ are as B P to B′ P′ (these being spaces described in equal times): and the ratio of these, however many may be the number of subdivisions, is always that of A B to A′ B′. Hence a gradual motion of the character described is one in which the velocity of the moving point increases in the same proportion as the distance from A.

In the preceding diagram, the time elapsed from B to C is the logarithm of A C, that of A B being 0. An infinite number of systems may be constructed, depending on the different velocities with which the moving point may be supposed to start from B. In Napier's system, at least in that system stripped of certain peculiarities not worth noting at present [NAPIER; BRIGGS], A B being a unit, the point starts from B at the rate of a unit of space (A B) in a unit of time: obviously the most simple supposition which can be made, and which has procured for this system the distinctive title of *natural* logarithms. In Briggs's system the point starts from B with such a velocity that (A B being 1) it shall have attained 10 times A B in one unit of time. This requires, as we shall see, an initial velocity of 2·302585 ... times A B in one unit of time.

In addition to the principles here laid down, a known property of the hyperbola very early showed that logarithms would become applicable to geometry: and thus it happened that the first decidedly algebraical step in the computation of logarithms was announced in Mercator's 'Logarithmotechnia,' as the quadrature of the hyperbola. Let A F and A G be the asymptotes of an hyperbola, and let A B, A C, A D, &c., be in continued geometrical progression. Draw B K, C L, D M, &c. parallel to the other asymptote A G, then the hyperbolic trapezia B K L C, C L M D, D M N E, &c., are equal, or B K L C, B K M D, B K N E, &c., are in arithmetical progression. So that any trapezium B K M D is a logarithm to its terminal abscissa A D. This property was the discovery of Gregory St. Vincent, who published it in his 'Opus Geometricum,' Antwerp, 1647. It was therefore unknown both to Napier and Briggs.



We shall now take the question of logarithms, availing ourselves of the power of modern algebra.

Definition.—By the logarithm of a number let any such function of that number be understood as has the following property. When x is to y as x' is to y', the logarithm [illegible] exceeds or falls short of the logarithm of y by as much as the logarithm of x' exceeds or falls short of that of y'. Let ϕx be the function which a number is of its logarithm: so that $x = \phi(\log x)$. If then a and $a+b$ be logarithms of x and y, and if c be the logarithm of x', then as $x:y::x':y'$, $c+b$ must be the logarithm of y'. And x, y, x' and y' are severally ϕa, $\phi(a+b)$, ϕc and $\phi(c+b)$. But $xy' = x'y$, or

$$\phi a \times \phi(c+b) = \phi c \times \phi(a+b).$$

Let ϕa or x be the number which has 0 for its logarithm; then $a = 0$; and calling N the number in question, we have

$$N \times \phi(c+b) = \phi c \times \phi b,$$

$$\text{or} \quad \frac{\phi(c+b)}{N} = \frac{\phi c}{N} \times \frac{\phi b}{N}.$$

But by the theorem proved in the article BINOMIAL THEOREM (p. 413), this can only be true on the supposition that $\phi c \div N$ is such a function of C as C^c, where C is independent of c. Consequently, the number whose logarithm is c must be NC^c. This evidently satisfies the conditions, and the theorem quoted shows it to be the only function which satisfies the conditions.

It is most convenient to assume 1 as the number N, which has 0 for its logarithm. We have then the following equation, connecting a number with its logarithm,

$$C^{\log x} = x:$$

so that every number has a logarithm for any value of C we may take, only it must be remembered that the same value of C must always be used. The logarithms of all numbers for a given value of C form a *system:* and C is called the *base* of that system.

Given a system of logarithms, we now inquire how to find the logarithms in any other system. Let A and B be the bases of the systems, and a and b the logarithms of any number x in the two bases. Then we have

$$A^a = x, \quad B^b = x, \quad \text{or } A^a = B^b;$$

$$\text{whence} \quad B = A^{\frac{a}{b}}, \text{ or } \log B \text{ (base A)} = \frac{a}{b},$$

$$b = \frac{a}{\log B \text{ (base A)}}, \text{ or } \log x \text{ (base B)} = \frac{\log x \text{ (base A)}}{\log B \text{ (base A)}};$$

that is, to turn one system of logarithms into another with any new base, divide every logarithm in the system by the logarithm which there belongs to the new base.

We now proceed to the method of determining logarithms. In the article LIMIT it is shown, by means of the binomial theorem, that of the two series

$$1 + a + \frac{a^2}{2} + \frac{a^3}{2.3} + \frac{a^4}{2.3.4} + \ldots.;$$

$$1 + ax + \frac{a^2x^2}{2} + \frac{a^3x^3}{2.3} + \frac{a^4x^4}{2.3.4} + \ldots.;$$

the second is the xth power of the first. A remarkably simple case presents itself, which, in fact, leads to Napier's system of logarithms: it is when $a = 1$. In this case the first series becomes

$$1 + 1 + \frac{1}{2} + \frac{1}{2.3} + \frac{1}{2.3.4} + \ldots..,$$

which is very convergent, and is 2·7182818 very nearly. This remarkable series is generally denoted by ε (sometimes by e, Laplace always uses c for it), and we have

$$\varepsilon^x = 1 + x + \frac{x^2}{2} + \frac{x^3}{2.3} + \ldots..$$

In Napier's system, then (we shall presently show that this is Napier's system), x is the logarithm of $1 + x + \frac{1}{2}x^2 + \ldots.$; or, the logarithm being given, the number can be immediately found.

Since the last equation is universally true, for x write $\log a \times x$, where $\log a$ means $\log a$ (base ε) The first side then becomes

$$\varepsilon^{\log a \times x}, \text{ or } \left(\varepsilon^{\log a}\right)^x, \text{ or } a^x;$$

$$a^x = 1 + \log a.x + \frac{(\log a)^2.x^2}{2} + \ldots..;$$

$$\frac{a^x - 1}{x} = \log a + \frac{(\log a)^2 . x}{2} + \ldots\ldots :$$

if x be diminished without limit, we have then

$$\text{Limit of } \frac{a^x - 1}{x} = \log a \text{ (base } \epsilon);$$

or, for a given (and very small) value of x, the logarithms of different numbers (a) are very nearly in the proportion of the values of $a^x - 1$. This is the theorem to which we have before alluded.

Let $a = 1 + b$, then

$$(1 + b)^x = 1 + xb + x\frac{x-1}{2}b^2 + x\frac{x-1}{2}\,\frac{x-2}{3}b^3 + \ldots$$

$$\frac{(1 + b)^x - 1}{x} = b + \frac{x-1}{2}b^2 + \frac{x-1}{2}\,\frac{x-2}{3}b^3 + \ldots :$$

if x diminish without limit, the limit of the first side has been shown to be log $(1 + b)$, the base being ϵ, which is always to be understood when the contrary is not expressed. The limit of the second side is easily found by making $x = 0$, and we thus have

$$\log (1 + b) = b - \frac{b^2}{2} + \frac{b^3}{3} - \frac{b^4}{4} + \ldots,$$

which however is only convergent when b is not greater than unity. Since this last is universally true, we find, by substituting $-b$ for b,

$$\log (1 - b) = -b - \frac{b^2}{2} - \frac{b^3}{3} - \frac{b^4}{4} - \ldots;$$

and subtracting the first from the second, remembering that

$$\log (1 + b) - \log (1 - b) = \log \frac{1+b}{1-b},$$

we find that

$$\log \frac{1+b}{1-b} = 2\left\{b + \frac{b^3}{3} + \frac{b^5}{5} + \ldots\ldots\right\}$$

$$\text{Let } \frac{1+b}{1-b} = x, \text{ or } b = \frac{x-1}{x+1};$$

$$\log x = 2\left\{\frac{x-1}{x+1} + \frac{1}{3}\left(\frac{x-1}{x+1}\right)^3 + \ldots\right\},$$

which is always convergent, but converges very slowly when x is considerable. If however we make

$$x = \frac{z+1}{z}, \text{ or } \frac{x-1}{x+1} = \frac{1}{2z+1};$$

then, remembering that $\log \frac{z+1}{z} = \log (z + 1) - \log z$, we have

$$\log (z + 1) = \log z + 2\left\{\frac{1}{2z+1} + \frac{1}{3}\frac{1}{(2z+1)^3} + \ldots\right\},$$

which is very convergent when z is even so small as 1, and serves to find the logarithm of any number when that of the next lower number is given. The two following series, which may be easily proved from the preceding, will complete the list of those which are most useful in practice:

$$\log (z + a) = \log z + \frac{a}{z} - \frac{1}{2}\frac{a^2}{z^2} + \frac{1}{3}\frac{a^3}{z^3} - \ldots$$

$$\log (z + a) = \log z + 2\left\{\frac{a}{2z+a} + \frac{1}{3}\left(\frac{a}{2z+a}\right)^3 + \ldots\right\}.$$

It only remains to show the identity of this system with that of Napier. If t be the number of seconds elapsed from the beginning of a motion, and if a^t be the length described in that time, then the time is the logarithm of the length described. The *velocity* at the end of t seconds in the differential coefficient of a^t, or a^t. log a, where the logarithm used is that of the preceding algebraical system: this velocity is therefore log a at starting, or when $t=0$. Now, in Napier's system this velocity is unity, or $a=\epsilon$: that is, the base of Napier's logarithms is the series called ϵ. But in the system where base is 10, log a is 2·3025851, which is the velocity at starting assumed by Briggs.

By the foregoing series a system of Naperian logarithms may be calculated with a very small fraction of the labour which they cost their inventor. This having been done for all whole numbers within the given limits, the logarithm of any fraction is readily found by subtracting the logarithm of the denominator from that of the numerator.

It must be admitted that Briggs, by his construction of the decimal system, divides with Napier the merit of inventing logarithms, considered as an instrument of calculation. In the Naperian system the table must either be carried to an enormous length, or whole numbers only must have logarithms, and every logarithm of a fraction will require two entries of the table and a subtraction. But in Briggs's system the logarithm of every decimal fraction can be found by one entry of the table, and one inspection of the fraction.

The peculiarity of this system (the base of which is 10) is as follows:—Every number or fraction is either a power of ten, positive or negative, or lies between two powers of ten. The powers of ten are ranged in the following table:—

$$\begin{array}{lll} 10^{-4} = \cdot0001 & 10^{0} = 1 & 10^{1} = 10 \\ 10^{-3} = \cdot001 & & 10^{2} = 100 \\ 10^{-2} = \cdot01 & & 10^{3} = 1000 \\ 10^{-1} = \cdot1 & & 10^{4} = 10000 \end{array}$$

From which the following rules may easily be obtained: a number which has m figures before the decimal point lies between 10^{m-1} and 10^{m}, and its logarithm therefore lies between $m - 1$ and m, or it is $m - 1 +$ a fraction less than unity. Also, if a fraction be less than unity, and if its first significant figure lie in the nth decimal place, this fraction lies between 10^{-n} and $10^{-(n-1)}$; so that its logarithm is $-n +$ a fraction less than unity. Now the convenience of Briggs's system lies in this, that the fraction less than unity, which is a part of every logarithm, does not depend on the position of the decimal point, but entirely upon the significant figures: the reason being, that an alteration of the position of the decimal point being a multiplication or division by some whole power of 10, alters the logarithm by the addition or subtraction of a whole number. This question is discussed in every treatise on the mode of using logarithms.

Let a be the base of a system of logarithms, and let log x signify simply the Naperian or natural logarithm of x; then by the theorem already proved

$$\log \text{ (base } a) = \frac{\log x}{\log a} = \frac{1}{\log a} \cdot \log x.$$

The factor $1 \div \log a$, which converts Naperian logarithms into those whose base is a, is called the *modulus* of the system whose base is a. In Briggs's system this modulus is ·4342945 nearly, and the logarithms of this system being called *common* or *tabular* logarithms, we have—

$$\begin{aligned} \text{common log } x &= \cdot4342945 \times \text{Nap. log } x \\ &= \frac{43}{99} \times \text{Nap. log } x, \text{ very nearly.} \end{aligned}$$

$$\begin{aligned} \text{Nap. log } x &= 2\cdot3025851 \times \text{com. log } x, \\ &= \left(\frac{100-1}{43} + \frac{1}{4000}\right) \times \text{com. log } x. \end{aligned}$$

In the article Negative and Impossible Quantities will be found a further extension of the theory of logarithms: in Tables will be found a list of tables for different purposes. A treatise on computation by logarithms will be found in the 'Library of Useful Knowledge,' in 'Examples of Processes of Arithmetic and Algebra.'

LOGARITHMIC CURVE and LOGARITHMIC SPIRAL. The former has for its rectangular equation $y = a^x$, and its most remarkable property is that its subtangent is the same at every point of the curve. The latter has $r = ca^{\theta}$ for its polar equation, and its tangent always makes the same angle with its radius vector; whence it is called the equiangular spiral.

LOGIC. [Organon.]

LOGISTIC. [Proportional.]

LOG'OS, λόγος, the Greek for *a word*, is used as a theological term.

1. *The Jewish doctrine of the Logos.*

The phrase *the Word* or *Memra of Jehovah* (מֵימְרָא דַיְיָ) occurs repeatedly in the Chaldee Targums, where it commonly stands in the place of יְהֹוָה (Jehovah) in the Hebrew original. There are however passages in which this phrase appears to denote a distinct personal existence; and many eminent critics, among whom are Bertholdt and Wegscheider, are decidedly of opinion that the Targumists intended it to apply to the Messiah; 'plainly showing it to have been their belief that the Shechinah, or Word, as some of them indeed expressly say, would employ the future Messiah, when he should be born, as the instrument of his gracious designs, and would be joined to him in a personal union.' (Bertholdt, *Christol. Jud.*)

Philo often speaks of the Logos, but his views on the subject are involved in much obscurity. He seems however to have had the idea of a two-fold Logos; the one denoting a conception in the divine mind according to which the world was created; the other a personal existence, the Son of God, partaking of the divine nature, though inferior to the supreme God, the Creator of the world (δημιουργος), presiding over the universe, the instructor and guide of man, the High Priest and Mediator between God and man. These two ideas of the Logos he often confounds together. The passages from Philo are collected in Dr. J. P. Smith's *Scripture Testimony to the Messiah*, book ii., cap. vii., sect. 4.

See also the descriptions of Wisdom and the Word of God in *Prov.* viii.; *Wisdom of Solomon*, x. 15-19; xi. 1-4; xviii. 15 (compare 1 *Cor.*, x. 4, 9, where the same actions are attributed to Christ); and in other parts of the *Wisdom of Solomon* and *Ecclesiasticus*.

These opinions are thought by some to represent the antient Jewish doctrine respecting the word of God, corrupted by a mixture of heathen philosophy; and by others to have been wholly borrowed either from the Platonic philosophy or from the Magian doctrine of divine emanations and Æons.

2. *The Christian doctrine of the Logos.*

The only examples of the theological use of this word in the New Testament are found in the writings of John (*Gospel*, c. i.; 1*st Epistle*, i. 1; *Rev.*, xix. 13). These passages are generally allowed to refer to Christ; but the sense in which Logos is to be taken, and the nature of the connection between this Logos and the person of Christ, are subjects of much dispute.

The Trinitarian expositors assert that these passages can mean nothing else than that the Logos is a distinct personal subsistence, which has existed from all eternity in a union of nature and of essence with God, which created the universe, and which was joined with a human nature to form the person of Christ.

The Arian doctrine represents the Logos as an emanation from the Deity, superior to all other created beings, and which supplied the place of a human soul in the person of Christ.

Most Unitarian divines consider it to be used either for God himself, or as an abstract term for the wisdom and intelligence of God which was fully imparted to Christ to fit him for his mission.

Those who attribute to the Logos a personal existence give different reasons for the origin of the name. Some explain it to mean the *speaker* or *teacher*, by metonymy, as Christ is called by John the Light, the Way, the Truth, the Life; others interpret it *the promised one;* and others consider that as speech (λόγος) is a *medium* of rational communication, so the name Logos is given to the *Mediator* between God and man, one who speaks to man in the name of God.

(The Lexicons of Schleusner, Wahl, and Bretschneider, *in loco;* Kuinoel, *Comment. in Lib. Hist. N. T., Prolegomena in Johan.*, sect. 7; Lücke *on the Epistles of John*, in the *Biblical Cabinet*, p. 102; Dr. J. P. Smith's *Scripture Testimony to the Messiah;* Lardner's *Letter on the Logos, Works*, vol. x.)

LOGWOOD, a kind of timber imported from the West Indies for the purposes of the dyer, is the wood of a low tree called *Hæmatoxylon Campechianum*, found very commonly in many parts of the West Indies and adjoining continent, especially Honduras, on which account it has been called Campeachy-wood. It belongs to the natural order Leguminosæ, and to the section Cassieæ. The branches are usually crooked, spiny, and deformed; the leaves are small and pinnate; the flowers grow in long racemes, are yellow, sweet-scented, and have ten separate stamens, half of which are shorter than the others. The fruit is a thin flat two-seeded legume, not opening at the sutures, but bursting longitudinally by a division passing down though both valves.

The wood is hard enough to take a fine polish, and might be used by cabinet-makers; it is not however imported for that purpose. In Jamaica the tree is used for fences, in the same way as the whitethorn in England, and it is said to be admirably adapted for the purpose. Logwood is so heavy as to sink in water, and scarcely susceptible of undergoing decay.

Its colouring matter is dissolved both by water and alcohol, and it is principally derived from the presence of a peculiar body, to which Chevreul, who discovered it, gave the name of *hematin* or *hæmatoxyline:* this is sometimes so abundant as to exist in the wood in crystals of distinct form, of a fine red colour, and considerable size. Besides hematin, logwood contains resin, oil, acetic acid, and salts of potash, and lime combined with a vegetable acid, a little sulphate of lime, alumina, peroxide of iron, and manganese. [HEMATIN; HÆMATOXYLON.]

Logwood is employed by the calico-printer to give a black or brown colour, the cloth being always first impregnated with alum mordant, and thus black is obtained. Iron mordant and logwood also yield a black, but it is not so good as with the alum mordant. Cloth with the alum mordant, dyed in a mixture of logwood and madder, has a fine brown colour fixed upon it. Logwood is also employed in the preparation of some lakes.

Trade.—(*Bois de Campèche*, French; *Kampescholz*, German; *Campecheout*, Dutch; *Palo de Campeche*, Spanish.) The importations of this dye-wood into the United Kingdom during each of the last ten years, and the quantities re-exported and taken for use, have been as follows:—

	Imported. Tons.	Exported. Tons.	Consumption. Tons.
1828	14,045	6395	9,297
1829	13,893	6226	8,852
1830	16,781	5937	10,100
1831	14,852	6011	10,405
1832	18,773	4427	12,415
1833	26,079	7045	17,595
1834	21,054	4548	14,026
1835	16,744	3697	14,727
1836	12,880	4385	12,361
1837	14,699	3316	12,023

The importations of logwood are brought into Europe from the West Indies and Mexico. The British possessions of Jamaica and Honduras have upon the average furnished about one half of the above importations into this kingdom. The principal part of the exportations from England are made to Russia, Prussia, and the Netherlands. Logwood is an article of commerce the price of which fluctuates violently. Under ordinary circumstances of demand and supply its price is from 5*l*. 10*s*. to 7*l*. per ton. It has sometimes been sold as low as 4*l*., and at others as high as 35*l*. per ton. At this time (January, 1839) a temporary short supply has raised the price to about 12*l*. per ton. The duty when imported from a British possession is 3*s*. per ton, and when from a foreign country 4*s*. 6*d*. per ton.

LOHEIA. [ARABIA.]

LOIR, a river in France belonging to the system of the Loire.

LOIR ET CHER, a department in France bounded on the north by that of Eure et Loir; on the north-east by that of Loiret; on the south-east by that of Cher; on the south by that of Indre; on the south-west by that of Indre et Loire; and on the north-west by that of Sarthe. Its form approximates to that of a parallelogram, having its longer sides facing the north-east and south-west. Its greatest length is from the neighbourhood of Montmirail (Sarthe) to that of Vierzon (Cher) 82 miles; its greatest breadth is from between Châteaudun (Eure et Loir) and Orléans (Loiret) to the neighbourhood of La Chartre (Sarthe) 46 miles. The area of the department is estimated at 2424 square miles; with a population in 1831 of 235,750; in 1836 of 244,043; showing an increase in five years of 8293, or about 3½ per cent.; and giving a little more than 100 inhabitants to a square mile. In respect of size the department is almost equal to the English county of Devon, but it has not half the population of that county. Blois, the capital, is 96 miles south-west of Paris in a direct line, or 105 miles by the road through Orléans. It is in 47° 35′ N. lat., and 1° 20′ E. long. from Greenwich.

The department is almost entirely a flat, having in the south-east part a considerable number of étangs, or pools, and marshes. The supracretaceous strata which occupy the chalk-basin of Paris extend into the department from the north-east, and occupy the banks of the Loire as far as the junction of the Beuvron. In all other parts the department is occupied by the chalk itself. The general inclination of the surface is toward the west and south-west.

The principal river is the Loire, which has a tolerably direct south-west course of 30 miles, or rather more, through the department, which it divides into two nearly equal portions; it is navigable throughout. The Cher, one of the principal tributaries of the Loire, enters this department on the south-east, near Mennetou, and flows westward, in one part upon, but mostly within, the border of the department, past the towns of Mennetou, Selles, St. Aignan, and Montrichard, into the department of Indre et Loire. The Cher is navigable for about 15 miles before leaving this department.

The Grande (or Great) Sauldre enters the department on the east side, and after being joined by the Petite (Lesser) Sauldre and the Rere, both of which also rise out of the department, and by the Croisine, joins the Cher just below Selles. The Feuzon, another feeder of the Cher, has a small part of its course within the department. The Beuvron and the Cosson enter the department from the east, and after receiving, each of them, a few small streams, fall into the Loire on the south-east bank, near one another, a few miles below Blois. The Cise Landezon, a small stream, falls into the Loire opposite the Cosson. In the northern part of the department the Loir enters it near Cloyes, a town a little below Châteaudun, and flows in a sinuous channel to the south-west past Freteval, Vendôme, Les Roches, and Montoire. The Braye, a feeder of the Loir, flows partly on, partly within, the north-western border till its junction with the Loir. The Graisne and the Coeuteron, feeders of the Braye, also water the north-west. None of these rivers are navigable in the department. The Canal du Berry, intended to shorten the navigation of the Loire, by avoiding the tedious bend between the junction of the Allier and that of the Indre, has about 46 or 47 miles of its course in this department.

The department is traversed by six 'Routes Royales,' or government roads, having an aggregate length of 189 miles, viz. 128 in repair, 28 out of repair, and 33 unfinished. The most important of these roads is that which runs from Paris through Châteaudun and Vendôme to Tours. The next in importance is that which runs from Paris by Orléans and along the north bank of the Loire to Blois. At Blois it divides; one branch continuing along the north bank of the Loire to Tours, where it joins the main road through Châteaudun, crosses the Loire, and runs to Angoulême and Bordeaux; the other branch crosses the Loire at Blois, and runs by Celles to Châteauroux, where it falls in with the road from Paris to Limoges, Cahors, and Toulouse. Another road runs from Blois to Vendôme and Le Mans. The main road from Paris by Orléans to Châteauroux and Limoges crosses the eastern side of the department. The 'Routes Départementales' are fourteen in number, and have an aggregate length of 253 miles, of which 149 are in repair, 29 out of repair, and 75 unfinished. The bye-roads and paths are in number two thousand two hundred and seventy-four, and have an aggregate length of 4190 miles.

The soil varies much; the northern part is in general more productive than the southern. About three-fifths of the whole are arable; and about one-seventh consists of land entirely unproductive, or of open waste land on which poor pasturage is obtained; about one-ninth of the soil is woodland. The quantity of meadow and good pasture land is small; but the vineyards are tolerably extensive. The quantity of grain raised is greater than the consumption of the department. The best wines are the white wines of Noels and Murettains and the red wines of the banks of the Cher. Vegetables, fruit, and hemp are grown in considerable quantity; liquorice and beet-root, the latter for sugar, are cultivated on a large scale. Horses, horned-cattle, and sheep are bred; the last in considerable number: there is a stud maintained at Blois for the improvement of the breed of horses; and prizes are given to the owners of the finest animals. Poultry, game, and fish are abundant. The mineral productions are limestone, gun-flints procured from the chalk strata, and potters' clay: some iron and lead mines are wrought.

The department is divided into three arrondissements, as follows:—

	Sq. Miles.	Pop. in 1836.	Communes.
Blois, central, .	971	118,561	138
Vendôme, north-west,	650	77,760	110
Romorantin, south-east	803	47,722	48
	2424	244,043	296

The three arrondissements contain 24 cantons, or districts under a justice of the peace.

In the arrondissement of Blois are Blois, capital of the department, on the north bank of the Loire (population in 1831, 11,002 for the town, or 13,138 for the whole commune; in 1836, 13,628 for the whole commune) [BLOIS]; Vienne, a suburb of Blois, south of the Loire: Mer and Suevre, near or on the north bank, and St. Dié, opposite Suevre, on the south bank of the same river; Herbault, Ouques, Marchenoir, and Ouzouer le Marché, north of the Loire, but distant from it; Chambord on the Cosson; Bracieux and Cour-Cheverny on or near the Beuvron; Contres and Cormier on the Bievre, a feeder of the Beuvron; and St. Aignan and Montrichard on the Cher; all south of the Loire. Mer (pop. 1717 for the town, 3733 for the whole commune) is in the centre of a vine distinct, and the townsmen carry on trade in wine and brandy. Suevre is a small place, with a population, in 1818, of about 1200. At St. Aignan (pop. 2228 town, 2772 whole commune) are some manufactures of woollen cloth. There are flint quarries near it. Chambord has a castle built by François I. from the designs of the architect Primatice: 1800 workmen were employed upon it for twelve years; but it was not quite finished until the reign of Louis XIV. It is a building imposing from its extent, but irregular in its construction. It is an assemblage of towers large and small, having its walls figured with small black round or lozenge-shaped stones. There is a remarkable double spiral staircase by which one person can ascend and another descend without their seeing each other. Chambord was till the time of Louis XIV. the frequent residence of the French kings. It was bestowed by Louis XV. on Maréchal Saxe, and by Bonaparte on Maréchal Berthier, prince of Wagram. At Menars on the north bank of the Loire, between Suevre and Blois, is a fine château in a park: it was formerly the abode of Madame de Pompadour, mistress of Louis XV., and subsequently of Maréchal Victor, duke of Belluno. It is now the residence of Prince Joseph de Chimay.

In the arrondissement of Vendôme are Vendôme, or Vendosme, Morée, Freteval, Les Roches, Montoire, and Trou, all on the Loir; Mondoubleau and Sargée on the Graisne; Droué and La Ville aux Clercs. Vendôme is on the Loir, which here flows in several channels; the two principal streams divide the town itself from the suburbs. A hill which commands the town is crowned by the ruins of an antient castle, the residence of the former dukes of Vendôme, destroyed during the troubles of the Revolution. The tombs of the princes of the house of Bourbon were on this occasion violated. The town is ill laid out, and by no means well built. It has a college of long established and deserved reputation. The cloisters of a fine Benedictine convent have been converted into barracks and the grounds into public walks; the conventual church has been made parochial. The population of Vendôme was, in 1831, 6590 for the town, or 7771 for the whole commune; in 1836 it was 8206 for the commune. The principal manufactures are of gloves, once very considerable but now decayed, paper, leather, and woollen stuffs. There are public baths, and some judicial and other government offices. Vendôme was antiently fortified, and was taken by storm by Henri IV. from the party of the League. The walls are now destroyed. It was the birth-place of the French poet Ronsard. Vendôme was formerly capital of the district of Vendômois, a subdivision of Beausse, or Beauce [BEAUSSE], and gave the title of count, afterwards of duke, to a branch of the house of Bourbon, which in the person of Henri IV. came to the throne. The duchy was subsequently granted to a natural son of Henri, who, with his descendants, acted a conspicuous part in the political and military affairs of France. Louis Joseph, duke of Vendôme, A.D. 1669—1712, was the last duke of this line, and was one of the ablest and most successful generals of Louis XIV. The victories which he gained at Brihuega and at Villa Viciosa, in 1710, re-established Philippe V. on the throne of Spain. Mondoubleau (pop 1838 town, 1917 whole commune) has the remains of a antient castle; the townsmen manufacture some serges and other woollens, earthenware, and glass. Montoire, otherwise called Querhoent (pop. 2433 town, 3072 whole commune), has a good square formed by a former duke of Tallard; the inhabitants manufacture serges and other woollens. In the arrondissement of Vendôme as many as seven hundred foundlings are brought up at the charge of the charitable institutions of Paris.

In the arrondissement of Romorantin are Romorantin, St. Genoux, La Ferté-Imbault, and Salbris on the Sauldre; Mennetou and Selles on the Cher; and La Ferté St. Aignan on the Beuvron. Romorantin gets its name from the Morantin, a brook which flows into the Sauldre at this spot. It was formerly the capital of the barren district of Sologne: and was the place from which the chancellor L'Hôpital issued an edict (called the edict of Romorantin) which prevented the establishment of the Inquisition in France. The population was, in 1831, 6537 for the town, or 6985 for the whole commune; in 1836 it was 7181 for the commune. The principal manufacture is that of woollen cloth. There are some fiscal and other government offices here. Selles (pop. 1915 town, 4121 for the whole commune) has an antient castle. The inhabitants manufacture some woollen goods. There are several corn-mills. La Ferté Imbault has a château or castle, which was in the time of Louis XIV. the residence of Maréchal d'Estampes.

The population of the above places, when not otherwise mentioned, is that of the whole commune, and from the census of 1831.

The department of Loir et Cher constitutes the diocese of Blois, the bishop of which is a suffragan of the archbishop of Paris: it is included in the circuit of the Académie Universitaire and in the Cour Royale of Orléans. It is in the fourth military division, the head-quarters of which are at Tours. It sends three members to the Chamber of Deputies. In respect of education it is backward as compared with the rest of France: of the young men enrolled in the military census of 1828-29, only 27 in every 100 could read and write; the average of France being nearly 40 in every 100.

This department was in the days of Cæsar occupied by the Carnutes and the Turones. The greater part of it afterwards constituted the Blaisois, or Blésois [Blois], but the department also includes part of the former districts of Touraine, Orléanois proper, and Dunois. It contains a great many châteaux.

LOIRE, a river in France, the basin of which is bounded on the east by the Cévennes, and the mountains which form their prolongation northward; by the mountains of Morvan, the heights of Beauce, and the Menez mountains on the north; and on the south and south-west by the mountains of La Margeride, the volcanic group of Auvergne, and the heights of Gâtines, which extend from the Auvergnat group to the Atlantic.

The limits thus described include a large portion of the centre and western parts of France, constituting nearly a fourth part of the whole country. The greatest length of the basin is from north-west to south-east, from the source of the Varenne, a feeder of the Mayenne, to Mount Lozère, 370 miles; its greatest breadth is from the source of the Bouleur, which flows by the Clain into the Vienne, to the source of the Arroux, 224 miles. Its area is estimated at 50,783 square miles, or about that of England.

The Loire rises in Mount Gerbier des Joncs, one of the Cévennes in the neighbourhood of Mount Mézin, several miles north-north-east of Mount Lozère, in the department of Ardèche. Its source is nearly 4600 feet above the level of the sea. The general direction of its course is at first north and north-west to Orléans, where it turns westward and flows into the Atlantic. Its first great tributary, the Allier, unites with it on the left bank, just below Nevers, at an elevation of 550 feet above the level of the sea, and at a distance of about 210 miles from its source. In the upper part of its course, above the junction of the Allier, the valley of the Loire is narrow, being bounded on the east by the prolongation of the Cévennes, which form the eastern limit of its basin, and on the west by a branch from the Cévennes, which divides the valley of the Loire from that of the Allier. The tributaries of the Loire, until the junction of the Allier, are all small; the Arroux alone, which joins it on the right bank, is navigable.

From the junction of the Allier to Orléans is a distance of nearly 100 miles, following the general course of the stream. The height of the bed of the Loire at Orléans is about 294 feet above the level of the sea. The Cher and Indre, two of its most important tributaries, join it on the left bank, 90 miles below Orléans, and not far below Tours, at an elevation of about 160 feet.

From the junction of the Cher and Indre, the Loire has a general western course of 133 miles, till it reaches the ocean. It receives, on its left bank, about 12 miles below the junction of the Cher, the Vienne, another of its great tributaries; and 36 miles lower down it receives the Maine or Mayenne, the only stream of magnitude which falls into it on the right bank throughout its whole course. At the junction of the Mayenne the height of the bed of the river is about 115 feet; and at Nantes, 48 miles lower down, and only 36 miles from the mouth of the river, 83 feet above the level of the sea.

The whole course of the Loire is above 530 miles. The navigation upwards and downwards commences at Roanne, 116 miles from its source, where it is joined by the Trambouze. It has, in the part above Roanne, a total fall of 3772 English feet, being an average of about 32·5 feet in a mile. The chief fall is in the part nearest its source. For two-thirds of the distance above Roanne it is used for floating timber, particularly of deals for boat-building; and boats can descend the stream from St. Rambert, above Roanne, but not ascend it.

This river, with its larger affluents, constitutes the great outlet for the produce of central and western France, and might be rendered much more available. The banks are celebrated for their beauty, particularly in the neighbourhood of Tours. From the melting of the snows in the Cévennes, in which it has its source, the Loire is subject to great inundations, to prevent which it has been embanked in the level tracts below Orléans. The sand and soil which its waters bring down form islands or shifting banks in its course, which materially impede the navigation, especially above Orléans: to avoid this inconvenience, a canal has been formed along the left bank of the river, from the Canal du Centre, at the junction of the Arroux, to the Canal de Briare, at Briare near Gien. Vessels of 900 tons are built at Nantes, but they cannot receive their cargoes above Paimbœuf. The tide flows about forty miles up the river, to a short distance above Nantes.

Two of the five great affluents of the Loire have been described elsewhere. [Allier; Cher.] The Allier rises in Mount Lozère, a few miles from the source of the Loire, and has a course of about 200 miles, nearly parallel to that of the Loire. It is navigable, during part of the year, for about 72 miles. The Cher rises near the Puy de Dôme, and has a course of nearly 200 miles, for about 55 of which it is navigable. It passes Montluçon, St. Amand, and Bourges.

The Indre rises in the remote ramifications of the central group of the mountains of Auvergne, and has a course of about 116 miles. The navigation, of 36 miles, commences at Loches. The Indre has no large affluents.

The Vienne rises in the Auvergnat mountains, west of the Puy de Dôme, and flows, first west past Limoges, and then north, past Chinon. Its whole course is about 150 miles, only about 50 of which are navigable, viz. from the junction of the Clain. It drains a large extent of country, and receives several considerable affluents.

The Mayenne rises in the southern slope of the Armorican chain, and has its course first west, and then south, past Mayenne, Laval, and Angers, just below which city it joins the Loire; its whole course is about 97 miles, for half of which, viz. from Laval, it is navigable. Though not so long as the Allier, the Cher, the Vienne, or even the Indre, its basin exceeds that of any of them, except the Vienne. Its principal feeder is the Sarthe, a stream thirty miles longer than the Mayenne, which flows by Alençon and Le Mâns, and is navigable from below Le Mâns 60 miles. The Sarthe receives the Loir (distinguished from the great stream, La Loire, by its masculine form Le Loir), a river of almost equal length with itself, which is navigable from Château du Loir, 53 miles.

The Loire was known to the Romans by the name Liger (Λείγηρ, Strabo) or Ligeris; the Allier by those of Elaver and Elauris. We are not aware that the Roman names of any of the other tributaries have been recorded.

We subjoin the following summary of the navigation of this vast river-system from the official statements of the French government:—

	Miles.
Length of the navigation of the Loire itself .	512
Arroux	12
Allier	156
Loiret	2
Vienne, 55 miles; Creuse, 5 miles .	60
Thoué, 11 miles; Dive, feeder of Thoué, 17 miles	28
Authion	26
Mayenne, 60 miles; Oudon, feeder of Mayenne, 11 miles; Sarthe, 80 miles; Loir, 75 miles . . .	226
Layon	37
Sèvre Nantaise . . .	10
Acheneau, 12 miles; Boulogne, 5 miles; Ognon, 4 miles; Tenu, 10 miles, feeders of the Acheneau . . .	31
Brivé	15

The navigation of the Indre is not stated; that of the Cher is comprehended in the Canal du Berry, and that of the Erdre, a small feeder which joins the Loire at Nantes, in the canal from Nantes to Brest. From the length assigned to the Loire itself, the Allier, the Sarthe, and the Loire, as compared with that given above, from measurement on Brué's large map (Paris, 1818), either inland navigation has been much extended of late years, or that part of the stream used for floating timber is included in the navigation. The Loire is connected with the Saône by the Canal du Centre, with the Seine by the Canals de Briare, d'Orléans, and du Loing, and with Brest harbour by the canal from Nantes to Brest. The Canal du Berry unites the upper and lower parts of the Loire, avoiding the great bend of the river at Orléans.

LOIRE, a department in the interior of France, bounded on the north by the department of Saône et Loire, on the east by the departments of Rhône and Isère, on the south-east by the department of Ardèche, on the south by that of Haute Loire; on the south-west and west by that of Puy de Dôme, and on the north-west by that of Allier. The form of the department is irregular; the greatest length is from north-north-west to south-south-east, from the neighbourhood of La Palisse (Allier) to that of Bourg Argental, 80 miles; its greatest breadth, at right angles to the length, is by a line drawn through Roanne, 41 miles. The area of the department is estimated at 1835 square miles, being about equal to that of the English county of Northumberland. The population in 1831 was 391,216; in 1836 it was 412,497, showing an increase in five years of 21,281, or more than five per cent.; and giving about 225 inhabitants to the square mile, a population which, in density, far exceeds the average of France, and is nearly double that of the English county compared with it. Montbrison, the chief town, is in 45° 36′ N. lat. and in 4° 4′ E. long.; 236 miles south-south-east of Paris in a direct line, or 298 miles by the road through Montargis, Nevers, and Roanne.

This department is formed of a portion of the valley of the Upper Loire, and its eastern and western boundaries are skirted by the mountains which bound that valley on each side. On the east side are the mountains of Le Lyonnais, dividing the basin of the Loire from that of the Rhône. The highest points are Mont Pilat (Mons Pileatus the 'capped mountain'), so called from its head being often enveloped with clouds, 4472 feet above the level of the sea, and Boussiore, or Boussière, between Pannissière and Tarare (Rhône), 3291 feet. In the south-east the department extends across these mountains to the banks of the Rhône.

On the west side of the department are the heights of Forez and La Made, otherwise La Madeleine, separating the valley of the Loire from that of the Allier. These two mountain-chains are chiefly composed of granitic rocks or of the older limestones and sandstones; part of the high ground between the Loire and Rhône is occupied by the coal-measures; and the valley of the Loire is occupied by strata belonging to the supracretaceous group. The coal-field of this district is the most important in France. There are forty-five mining establishments, which extend over an area of 42,038 English acres. The quantity procured in 1835 was 812,914 tons: and the distribution of their produce is facilitated by the two noble rivers to which the coal-field is adjacent. The quality of the coal is very good. There are iron and lead mines in the mountains, and quarries of granite, porphyry, and marble. Whetstones and emery are also procured.

The department belongs almost entirely to the basin of the Loire, which river enters it on the south, just below Aurec (Haute Loire), and flows northward, past St. Rambert (where the downward navigation commences), Feurs, and Roanne (where it becomes navigable, both upward and downward), into the department of Saône et Loire. From the narrowness of the valley through which it flows, its tributaries are all small; the Furand, the Coize, the Loise, the Trambouze, and the Sornin join it successively on the right bank; and the Bouson, the Maire, the Lignon, the Aix, the Repaison, and the Tessonne, on the left. A small portion of the south-eastern extremity of the department belongs to the basin of the Rhône, and is skirted by that river, which divides it from the department of Isère. The Gier and the Diaume, which belong to the system of the Rhône, water this part. The official returns make the navigation of the Loire in this department amount to 83 miles, which extends it far above Roanne or St. Rambert, and shows either that the upper part has been made navigable of late years, or that the part used only for floating timber is included in the return. About five miles of the navigation of the Rhône belong to this department.

There are two canals: that from Roanne to Digoin, lateral to the Loire, 11 or 12 miles of which are in this department; and that from Rive de Gier to Givors (Rhône) on the banks of the Rhône, of which four or five miles are in this department.

There are six government roads, having an aggregate length of 192 miles, of which nearly three-fourths are in repair, the rest out of repair or unfinished. There are eleven departmental roads, having an aggregate length of 231 miles, about two-thirds of which are in good repair. There are four thousand four hundred and twenty-four bye-roads and paths, with an aggregate length of nearly 5000 miles. The principal road is that from Paris by Moulins to Lyon: it passes through Roanne. The road from Lyon to Nîmes crosses the south-east corner of the department, that from Lyon to Clermont passes through Feurs and Boën; and that from Lyon to Le Puy passes through St. Etienne. There is a railroad from St. Etienne to Lyon.

The climate of the department is temperate, and the soil, though not distinguished by fertility, tolerably productive. About half the soil is arable, but the quantity of grain is not sufficient for the dense population. There is a considerable proportion of meadow-land, on which a great number of cattle are bred. The cheeses of La Roche and Barrasin, villages in the department, are much esteemed. The vineyards are tolerably extensive, and some of the wine is in good repute. A small quantity of cider is made. The quantity of poultry reared is considerable, especially turkeys, which are fattened on chesnuts. The woods occupy rather more than an eighth of the department: they consist chiefly of pines and other resinous trees, from which excellent turpentine is obtained. The deals are sent down the Loire for boat-building and other purposes.

The department is divided into three arrondissements, as follows:—

		Area in Sq. Miles.	Population in 1831.	Population in 1836.	Communes.
Roanne .	N.	688	121,817	124,871	108
Montbrison,	Central .	749	120,210	124,050	138
St. Etienne,	S.E. .	398	149,189	163,576	72
		1835	391,216	412,497	318

There are 28 cantons or districts, each under a justice of the peace.

In the arrondissement of Roanne are Roanne, on the Loire (population in 1831, 8890 town, 9260 whole commune; in 1836, 9910 commune) [ROANNE]: Villerost, near Roanne, on the same river; Perreux, also near Roanne, but not on the Loire; Charlieu (pop. 3123 town, 3424 whole commune), on the Sornin; Regny, Lay, St. Symphorien de Lay, and St. Just, on the Trambouze, or its branches; Néronde, on a small stream running into the Loire; St. German la Val and St. Just en Chevalet, on the Aix; St. Haon le Châtel and Renaison, on or near the Renaison; Aubierle, Changy, Crozet, and La Pacaudière, on or near the Tessonne. These are almost all small places. Perreux is famous for its wines. St. Symphorien de Lay (pop. 4500) has considerable cotton-manufactures; the town, which is walled, does not contain much above a fourth of the population of the commune. La Pacaudière is a tolerably pleasant town of 60 or 700 inhabitants. St. Just en Chevalet is on the slope a hill: it has about 1000 inhabitants, who make hats and trade in the wood grown in the neighbourhood.

In the arrondissement of Montbrison are Montbrison, capital of the department, on the Vizezy, a small feeder of the Lignon; Moingt and Chaudieu, both near Montbrison; L'Hôpital and Boën, on the Lignon; St. Marcellin and Sury-le-Contal, on or near the Maire; St. Bonnet-le-Châtel, near the Bouson; St. Rambert and Feurs, on or near the Loire; Panissière, near the Loire; and Chazelle and Galnier, or St. Galmier, near the Coize or Croize.

Montbrison, built in the twelfth century, was the capital of the district of Forez. The town is commanded by a picturesque volcanic rock, from the top of which, in the religious wars of the sixteenth century, the Baron des Adrets, a Huguenot leader, is said to have precipitated his Catholic prisoners. The town is ill laid out and ill built; but great improvements have been made in the course of the present century by filling up the ditches which previously surrounded the town, and forming a handsome boulevard on the site of them, and by laying out and building new streets. The college, or high-school, formerly an Ursuline nunnery, has been so enlarged and embellished as to become a handsome structure. There are a theatre and a fine range of barracks for cavalry. The courts of law, the church of St. Marie, and the corn-market are handsome buildings. The population in 1831 was 5040 for the town, or 5265 for the whole commune; in 1836 it was 6266 for the commune. The townsmen manufacture some linens of different fineness. There are a small public library, an agricultural society, a botanic garden, and the different public offices necessary in a departmental capital. There are public baths, and in the neighbourhood are some mineral waters, which were known to the Romans. Some Roman antiquities have been discovered near the town, and among others the ruins of an amphitheatre.

Feurs was the Forum Segusianorum of the Romans, the antient capital of the Segusiani: it gave name to the district of Forez. Many of the houses have cellars evidently of Roman construction. There are numerous vestiges of Roman monuments. Remains of aqueducts extend for more than a mile from the town. The traces of the antient walls show the extent and importance of the place. There is an antient cromlech near the town. St. Galmier (pop. 1800 town, 2659 whole commune) has some manufactures of wax tapers for use in churches: near the town are some mineral waters. Boën has a population of about 1500: there is a paper-mill, and some trade is carried on in the corn, wine, and wood of the surrounding country. L'Hôpital has about 1000 inhabitants.

In the arrondissement of St. Etienne are St. Etienne, on the Furand (pop. in 1831, 33,064; in 1836, 41,534) [ETIENNE, ST.]; Bourg Argental, on the Diaume; St. Sauveur and St. Julien, in the neighbourhood of Bourg Argental; Le Chambon and Firmini, on a small feeder of the Loire; St. Genest, on another small feeder of the same river; Chavanay and Condrieu, on or near the Rhône; St. Chamond and Rive de Gier, on the Gier; Chagnon, Romain, and La Fouilleuse.

At Bourg Argental (pop. 1734 town, 2502 whole commune) crapes and some other silk fabrics are made from the silk produced in the canton of Pellusin near the Rhône, where the mulberry-tree is cultivated on a large scale. At Le Chambon (pop. 1600) coal-mines are wrought, ribands are woven, and nails, files, and knives manufactured. Firmini (pop. 2438 town, 3779 whole commune) has also productive coal-mines, and has the same manufactures as Le Chambon. St. Chamond (pop. 7475) is situated in a hollow, the sides of which are adorned by orchards, woods, and vineyards. Several of the houses are handsome, and have pleasant grounds. The parish church is a handsome building: there are public baths and a pleasant public walk. Some vestiges of Roman antiquities have been found near the town. The inhabitants are engaged in throwing silk and weaving ribands, in working coal-mines, and in the manufacture of nails or cast-iron. There are quarries of freestone in the neighbourhood. Near Rive de Gier (pop. 9178 town, 9706 whole commune) are extensive coal-works; the pits are above 950 feet in depth, and one pit is said to be nearly 1100 feet deep. There are iron-works in the town, several glass-houses and a silk-throwing mill. The soot and dust from these various establishments blacken the whole place, and render it always dirty. There is a basin or reservoir of the canal, which communicates between this town and Givors on the Rhône. Lyon is supplied with coal from this neighbourhood. Some of the coal strata in this arrondissement have been in a state of combustion for centuries. Muriate of ammonia is procured where this combustion is going on.

The population of the above towns, where not otherwise distinguished, is that of the commune, and is from the census of 1831.

The chief branches of industry in the department have been noticed above. They depend almost entirely on the abundant supply of fuel furnished by the coal-mines of the department. In addition to those already mentioned, the manufacture of coarse woollen cloths, of cotton twist, of linen and cotton fabrics, and leather, may be noticed.

The department of Loire forms, with that of Rhône, the archiepiscopal diocese of Lyon and Vienne. It is in the jurisdiction of the Cour Royale and the circuit of the Académie Universitaire of Lyon; it is included also in the nineteenth military division, the head-quarters of which are at Lyon. It sends five members to the Chamber of Deputies.

The state of education in this department is backward. In the military census of 1828-29 only 29 of every 100 young men enrolled could read and write; the average number in all France being about 39 in every 100.

This department comprehends the antient territory of the Segusiani, with portions of some of the adjacent states; in the division of Gaul under the Romans it was included in the province of Lugdunensis Prima. Some Roman towns were included within it, as Forum Segusianum, *Feurs*; Rodumna, *Roanne*; Aquæ Segete, perhaps Aissumin, a village on the bank of the Loire; and Carilocus, a town of the Ædui, *Charlieu*. It includes the former district of Forez and portions of Le Beaujolais and Le Lyonnais proper, all subdivisions of the province of Lyonnais. At the commencement of the Revolution the departments of Rhône and Loire constituted but one, under the title of Rhône et Loire; they were subsequently divided.

LOIRE, HAUTE, a department in the interior of France, bounded on the north by the departments of Puy de Dôme and Loire; on the east and south-east by that of Ardèche; on the south and south-west by that of Lozère; and on the the west by that of Cantal. Its form is irregular. Its greatest length is from east to west, from near Bresle to between Montfaucon and Bourg Argental (Loire) 68 miles; its greatest breadth from north to south is from near Craponne to the neighbourhood of Pradelles, 44 miles. Its area is estimated at 1931 square miles, which is considerably below the average extent of the French departments, but exceeds by 60 square miles that of the English county of Northumberland. The population in 1831 was 292,078, in 1836 it was 295,384, showing an increase in five years of 3306, or little more than one per cent., and giving about 153 inhabitants to a square mile, which is rather under the average density of the population in France: but considerably above that of Northumberland, with which county we have compared it in respect of area. Le Puy, the capital, is on the left bank of the Loire, in 45° 2′ N. lat. and 3° 53′ E. long., 271 miles south by west of Paris in a direct line, or 304 miles by the road through Nevers, Moulins, and Clermont.

The department is almost entirely mountainous, at least hilly. The chain of the Cévennes passes just along the eastern boundary; the mountains of La Margeride, which unite the Cévennes to the central group of Auvergne, pass along the south-western boundary; and a branch of the Cévennes, which separates the valleys of the Allier and the Loire, passes northward through the middle of the department, from Pradelles to La Chaisedieu. Nearly the whole of the department is occupied by these mountains or their branches; and the only tracts that approach to a more level character are on the north side of the department, where the valleys of the Loire and the Allier expand to some breadth. The mountains consist for the most part of granite and the other primitive rocks, mingled with basalt and lava, the product of volcanoes long since extinct. The valley of the Allier is occupied by the supracretaceous strata. The mountains are in many places of picturesque form. Mont Mézin, or Mézene, is a colossal mountain of volcanic matter, rising more than 5000 feet above the granite on which it rests; and having a total elevation of 5816 feet above the level of the sea. This mountain, which belongs to the principal range of the Cévennes, presents some magnificent ranges of basaltic columns. In the same line are

Mont Tartas, Les Infernels, Mont Caou, or Mont Chaud, and others; all mountains of similar volcanic origin and character: Tartas has an elevation of 4410 feet above the level of the sea. The currents of volcanic matter ejected in a state of fusion from these or other mountains appear to have interrupted in several places the course of the Loire and the Allier, and obliged those streams to work out a more circuitous channel. In many places however the channels of the rivers penetrate through the volcanic rocks. The names of several of these extinct volcanoes appear to have had a Roman origin. Tartas, or Tartarou, embodies the Latin Tartarus; and Les Infernels, or Infernês, the Latin Infernus. The most striking ranges of basaltic columns in the department are those of St. Arcons d'Allier near Langeac on the Allier; Fare near Pradelles; and Espailly Polignac, and others, near Le Puy, in the valley of the Loire.

The mineral treasures are coal, lead, and antimony; granite, serpentine, statuary and other marbles; excellent freestone for building, sandstone for mill-stones, and gypsum. The quantity of coal produced in 1835 was 21,883 tons: it is the eighth of the departments in respect of its productiveness of this mineral. The chief coal-pits are at Frugères.

The principal rivers are the Loire and the Allier, which enter the department on the south, the Loire from the department of Ardèche, the Allier from that of Lozère, in which departments they respectively have their rise on each side of the central mountain-range already described. The valley of the Loire separates the central mountain-range from that of the Cévennes; and is very narrow, except in the northern part of the department. The river flows by or near Le Puy, Roche en Regnier, Beauzac, Monistrol, Bas-en-Basset, and Aurec. Its tributaries are all small. The valley of the Allier, which separates the central mountain-range from that of La Margeride, is also narrow, except just in the north part of the department. This river flows by or near Langeac, Brioude, and Auzon; its chief tributaries are the Chapeauroux (which joins it just within the department), the Ance, the Senouire, and the Alagnon. There are in the mountains several small lakes, or rather ponds.

In the official returns the Allier is stated to be navigable for ten or eleven miles in this department: probably from Brioude, where many boats are built. As in other authorities the commencement of the navigation is marked as being a little above Vichy (Allier), about sixty miles lower down, it is probable that in this upper part of its course boats can only descend the stream, not ascend it. There is no other inland navigation.

There are six Routes Royales, or government roads, in the department, having an aggregate length of 181 miles; of which (1st Jan. 1837) 123 were in repair, 22 out of repair, and 36 unfinished. The principal road is that from Paris by Clermont and St Flour to Narbonne and Perpignan, and so into Spain: this just passes through the north-western corner of the department, through the little town of Lempde, on the Alagnon. From Lempde a road branches off to Brioude, Paulhaguet, and Le Puy. From Le Puy roads run to Ambert and other towns in the department of Puy de Dôme, to Le Voulte (Ardèche) and other towns on the Rhône, to Pradelles and to Yssengeaux. From Pradelles are roads to Mende (Lozère) on the one hand, and on the other to Aubenas, Privas, and Viviers (Ardèche); and from Yssengeaux are roads to St. Etienne (Loire), and to Annonay (Ardèche). The Departmental Roads, twelve in number, have an aggregate length of about 250 miles, of which only about 100 miles are in repair. There are more than three thousand eight hundred bye-roads or paths, having an aggregate length of more than 3700 miles.

It is probable that the lowest part of the department is nearly 1000 feet above the sea level; and the summits of the highest mountains exceed 5000 feet. The climate is too cold to admit of the cultivation of the vine, except in a few more sheltered spots, as in the bottom in which the town of Le Puy stands; and there are some parts where it is too cold to admit the growth even of rye. The soil is of middling fertility. In the vague classification of the government papers three-fifths are said to be 'sandy,' nearly three-tenths stony, and the rest gravel, chalk, or limestone, with a very small proportion, about 2500 acres, of rich loam. Nearly half the land is under the plough, and the produce in grain exceeds the consumption of the department. The vineyards occupy 14,000 to 15,000 acres, but the growth of wine is inadequate to the supply of the department. The quantity of meadow land is considerable; and the heaths or commons and open pastures occupy nearly one-fifth of the surface. The breeding of cattle, and still more that of sheep, is much attended to. Mules are bred in considerable number. There are many bees kept; and in some spots silkworms are reared. Chesnuts are grown in large quantity: some kinds of fruit are cultivated to a considerable extent. The woods occupy more than a seventh of the whole department.

The department is divided into three arrondissements, as follows:

	Sq. Miles.	Population in 1831.	Population in 1836.	Communes.
Le Puy, Central and S.	860	129,722	130,844	112
Yssengeaux, or Issengeaux, N.E.	463	81,664	81,785	36
Brioude, N.W.	608	80,692	82,755	118
	1931	292,078	295,384	266

It is subdivided into twenty-eight cantons, or districts under a justice of the peace.

In the arrondissement of Le Puy are Le Puy (population in 1831, 14,844 town, 14,930 whole commune; in 1836, 14,924 commune) on the Borne, a feeder of the Loire, not far from that river; Alegre and St. Paulien (pop. 3017) near the Borne; Craponne (pop. 2274 town, 3828 whole commune) and Chomelis near the Arzon, which also joins the Loire; Roche en Reignier, on the Loire; Fay le Froid, on the Lignon, another feeder of the Loire; Monastier (pop. 1983 town, 3420 whole commune), on the Gazeille, a small feeder of the Loire; Pradelles, on a small feeder of the Allier; and Saugues (pop. 1884 town, 3833 whole commune) on the Suejols, another small tributary of the Allier.

Le Puy is described elsewhere. [PUY, LE.] The immediate neighbourhood of the city is remarkable for the picturesque forms of its volcanic rocks. That of Corneille, which immediately commands the town, is of the form of an immense cube; the rock of Polignac (mentioned above) is an oblong square, three sides of which are precipitous, crowned with the ruins of an antient castle; that of St. Michel is a lofty cone, above 300 feet high, having a church with a steeple on its summit, so that it appears, on a distant view, like a vast obelisk: the ascent to the church is by a flight of two hundred and sixty steps in the side of the rock. The rocks of Espailly are in the same neighbourhood; they have been noticed already, in speaking of the geological character of the department. There are some remarkable caverns near Le Puy. At the base of the rock of St. Michel is an antient building said to have been a temple of Diana; and on the face of that of Polignac is a coarsely sculptured head of Apollo. There are the ruins of an old castle in the same neighbourhood. Le Puy is on a site elevated more than 2000 feet above the level of the sea. Pradelles is yet higher: its site, which consists partly of granitic, partly of volcanic rocks, is 3721 feet above the level of the sea: it contains about 1200 to 1500 inhabitants.

In the arrondissement of Yssengeaux are Yssengeaux, or Issengeaux, between the Terrasse and the Lignon, feeders of the Loire; Beauzac, Monistrol (pop. 4145), Bas en Basset (pop. 5524), and Aurec, on or near the Loire; St. Didier la Sauve (pop. 1993 town, 3795 whole com.), on a feeder of the Loire; Montfaucon, near the Dunières, which flows into the Lignon; and Tence (pop. 5730), on the Lignon.

Yssengeaux is a small town, with a population, in 1831, of 3133 for the town, or 7166 for the whole commune; in 1836, of 7621 for the commune. The roofs of the houses are commonly covered with basalt. There is an Agricultural Society in the town. A rich lead-mine is wrought in the neighbourhood, and peat for fuel is dug. Monistrol has an antient palace of the bishops of Le Puy, remarkable for its lofty situation. The townsmen manufacture locks, leather, ribands, and lace. Montfaucon has a population of from 1200 to 1500.

In the arrondissement of Brioude are Brioude (pop. in 1831, 5052 town, 5099 whole commune; in 1836, 5247 commune); Langeac (pop. 2345 town, 3109 whole commune), Vieille Brioude, close to Brioude, La Motte, and Auzon, all on or near the Allier; Blesle on the Voureze, a feeder of the Alagnon; Lempde on the Alagnon, Paulhaguet on the Senouire, and La Chaisedieu, nea source of the same river. Brioude and Vieille are described elsewhere. [BRIOUDE.] Antimo stones, and whetstones are quarried in the neighbourhood of Langeac. Lempde is in a fertile district; it has a population of about 1000: there is a bridge over the Alagnon. Excellent coal is dug in the neighbourhood. At the village of Vezezouls, on the Allier, many boats are built for the navigation of that river.

The manufactures of the department consist chiefly of thrown silk, lace, paper, and woollen stuffs; skins for holding wine or other liquids; bells for horses and mules, glass, and leather. The trade consists in the sale of the foregoing articles, grain, chesnuts, dried pulse, sheep, mules, and deals. Three thousand individuals leave the department yearly to obtain employment in other departments as sawyers, embankers, chimney-sweeps, porters, &c.

This department constitutes the diocese of Le Puy, the bishop of which is a suffragan of the archbishop of Bourges. It is in the jurisdiction of the Cour Royale of Riom, and in the circuit of the Académie Universitaire of Clermont Ferrand. It is in the nineteenth military division, the head-quarters of which are at Lyon. It returns three members to the Chamber of Deputies. There is a Protestant consistorial church.

In respect of education, it is one of the most backward of the French departments. Of the young men enrolled in the military census of 1828-29 only 21 out of every 100 could read and write; being very little more than half the average number in France taken as a whole.

This department was the country of the Vellavi, a Celtic tribe whose chief town was Revessio, now St. Paulien near Le Puy. Under the Romans it was included in Aquitania Prima. It afterwards came into the hands of the Visigoths, then of the Franks, and in the middle ages formed part of the extensive dominions of the Counts of Toulouse, to whom it is probable that the bishops of Le Puy, who held the county of Le Vélay (as, from the name of its antient inhabitants, the district was called) were subject. From the Counts of Toulouse the district came to the crown of France, under which it constituted part of Languedoc. The department comprehends, besides Le Vélay, some portions of Le Vivarais and Le Gévaudan (two other subdivisions of Languedoc), of the duchy of Auvergne, in the province of Auvergne, and of the district of Forez in Le Lyonnais.

LOIRE INFE'RIEURE, a maritime department of France, bounded on the north-west by the department of Morbihan; on the north by that of Ille et Vilaine; on the north-east, for a little space, by that of Mayenne; on the east by that of Maine et Loire; on the south by that of Vendée; and on the west by the Atlantic ocean. Its form is irregular. Its greatest length is from east to west, from Ingrande (Maine et Loire) on the frontier of this department to the Pointe de Piriac, north of the little town of Le Croisic, 75 miles: its greatest breadth, at right angles to the length, is from the village of Soulvache, not far from Châteaubriand, to the little town of Legé, near the head of the Logne, a small stream that flows into the lake of Grand Lieu, 69 miles. The area of the department is estimated at 2639 square miles, being rather greater than that of the English county of Devon: the population in 1831 was 470,093, in 1836 it was 470,768, showing an increase in five years of only 675, or about one-seventh per cent., and giving 178 inhabitants to a square mile. In area, in population, and in density of population it is considerably above the average of France; but in the last two particulars it is inferior to the English county with which we have compared it. Nantes, the chief town, is on the north bank of the Loire, at the junction of the Erdre; in 47° 13′ N. lat. and 1° 33′ W. long.; 208 miles west-south-west of Paris in a direct line, or 231 miles by the road through Versailles, Chartres, Le Mans, and Angers.

The coast of this department presents a broken and irregular outline. It commences at the bottom of the little bay of Pennebe, south of the æstuary of the Vilaine, where the boundary between the departments of Morbihan and Loire Inférieure meets the ocean. This coast-line then forms the headland of Pointe de Piriac and Pointe du Croisic, with the intervening bay or roadstead of Pembron, and proceeds south-east, forming a second shallow bay between the villages of Le Poulinguen and St. Sebastien, to the mouth of the Loire, which is about seven miles wide. From the Pointe de Cheveche, which is on the south side of the mouth of the Loire, the coast forms the bay of Bourgneuf, at the bottom of which, at the mouth of the little river Falleron, the boundary of the departments of Loire Inférieure and Vendée meets the ocean. Belle Ile, opposite the Pointe de Piriac, belongs to the department of Morbihan; and Ile de Boin and Noirmoutier, of which the former is in the bay of Bourgneuf, and the second off the entrance of it, belong to the department of Vendée. The town of Le Croisic is on a headland insulated at high water, but at other times connected with the mainland by the sand. The whole length of the coast is nearly fifty miles: it is for the most part low and skirted by broad sands. The soil brought down by the Loire and other rivers is causing the land here to gain gradually on the sea. In estimating the maritime facilities of the department, the wide æstuary of the Loire, by which large vessels can get up to Nantes, must be taken into the account. There are considerable salt marshes along the coast.

The surface of the department is generally level, especially in the northern, western, and southern parts. In the north-eastern and eastern parts, the high land, which separates the basin of the Loire from that of the Vilaine, extends to the upper part of the river Erdre. The country slopes gradually towards the west. The Loire has a fall in its course through this department of about 100 feet in nearly seventy miles, of which fall more than 80 feet are below Nantes.

The department is occupied chiefly by the coal-measures and the subjacent strata, covered in some places by alluvial deposits. There are some strata of good coal on the banks of the Loire and the Erdre; the principal coal-works are between Ancenis and Ingrande, and at Nort. In respect of productiveness of coal, this department ranks next to that of Haute Loire, and is the ninth department in France. The quantity raised in 1835 was 21,742 tons. Peat is dug near the mouth of the Loire, on the north bank. Iron-ore is tolerably abundant; and a tin-mine is wrought at Piriac on the coast. Fine-grained granite, slate, marble of a greyish tint, and limestone are quarried in different places. The loadstone is found on the north bank of the Loire, near the mouth; and crystals of quartz, from which the 'Alençon diamonds' are made, mica, felspar, kaolin or porcelain earth, and clay for various purposes are procured. There are considerable salt-works in the marshes on the coast.

The most important river is the Loire, which touches the border of the department at Ingrande (Maine et Loire), and forms for about 20 miles the boundary between this department and that of Maine et Loire: its remaining course, which is about 50 miles in length, is within the boundary of this department. The bed of the Loire is in this part full of small islands, which line its channel. It is navigable throughout its course, for small vessels; large vessels can get up to Nantes, where there is a bridge.

The Vilaine forms, for about 20 miles between Langon and Rieux, the north-western boundary of the department, which it separates from those of Ille et Vilaine and Morbihan. It is navigable throughout for small vessels. The Falleron, a small stream not navigable, forms for about eight miles the southern boundary of the department.

The other rivers are feeders either of the Loire or of the Vilaine. The Havre joins the Loire at Oudon; the Erdre, 50 miles long, at Nantes; and the Elier de Mean, or Brivé, above St. Nazaire; all on the north bank. The Erdre, the largest of the three, rises in the department of Maine et Loire, near the town of Cande, flows westward into the department of Loire Inférieure, and turning southward above the little town of Nort, joins the Loire. Just above its junction it expands into a long lake of about a mile and a half broad, and six or seven miles long. The navigation forms part of the canal from Nantes to Brest: it commences below Nort, about 12 miles from the junction of the Erdre with the Loire. The Divate rises in the department of Maine et Loire, and forms the boundary of the two departments till its junction with the Loire: the Sèvre Nantaise joins the Loire at Pont Rousseau opposite Nantes; and the Acheneau at the village of Brezay, between Nantes and Paimbœuf: all these join the Loire on the south bank The whole course of the Sèvre Nantaise is about 65 miles about one-third of which is in this department or upon the border: the navigation commences at the village of Monnières, about 10 miles above its junction with the Loire. The Acheneau is the outlet of the lake of Grand Lieu, a considerable sheet of water, approximating in form to a square with a side of four or five miles. Its area is estimated at 17,000 or 18,000 acres. It receives the Boulogne, 34 miles long (augmented by the Logne and the Isoire), on the south, and the Ognon, 20 miles long, on the east. The Tenu, 18 miles long, joins the Acheneau just after the latter leaves the lake on the north side. The Ognon, the Boulogne, and the Isoire rise in the department of Vendée. The Acheneau is navigable throughout its whole course from the lake of Grand Lieu to the Loire, about 12 miles.

The affluents of the Vilaine are the Cher, 25 miles long; the Don, 40 miles long; and the Isaac, 34 miles long: they belong entirely to this department.

Besides the lake of Grand Lieu, which is the largest inland lake in France, there are nearly six hundred smaller lakes or pools, whose aggregate area is about equal to that of Grand Lieu.

The only canal is that from Nantes to Brest, of which about 60 miles are in this department. The navigation of the Erdre is incorporated in this canal, and is included in the length given above. From the Erdre the canal follows the valley of the Isaac, on the right bank of that river, to the Vilaine.

There are six Routes Royales, or government roads, having an aggregate length of 299 miles, of which 208 were (1 January, 1837) in repair, 45 out of repair, and 46 unfinished. The principal road is that from Paris to Nantes and Paimbœuf. It enters the department immediately after leaving Ingrande (Maine et Loire) on the north bank of the Loire, and proceeds along or near that bank by Varades, Ancenis, and Oudon to Nantes. It crosses the Loire by the bridge at Nantes to Pont Rousseau, and passes along or near the south bank to Paimbœuf. Roads lead from Nantes by Pont Château and Roche Bernard (Morbihan) to Vannes (Morbihan); to Rennes (Ille et Vilaine), one by the village of Derval and another by Châteaubriand; by Pont Rousseau and Legé to Les Sables d'Olonne (Vendée); and by Pont Rousseau and Montaigu (Vendée) to La Rochelle (Charente Inférieure). There is a road from Ancenis by Nort and Blain to Rédon (Morbihan). There are also thirteen Departmental Roads, having an aggregate length of more than 200 miles, of which not quite 120 miles are in good repair; the rest out of repair or unfinished. The bye-roads and paths are about 5500 in number, with an aggregate length of about 8000 miles.

The air of the department is mild, but humid: the predominant winds are the south-west and north-east. The thermometer does not commonly exceed 93° (Fahrenheit) in the hottest part of the summer, or fall below 45° or 50° in winter: the mean temperature of the year is about 57°. The department is considered healthy on the whole, though some diseases are promoted by the moisture of the climate.

Nearly half the soil is under the plough: wheat, oats, rye, buckwheat, millet, and a little barley are the kinds of grain chiefly cultivated; the quantity raised is equal to the consumption of the department. Pulse and flax are also grown. Meadow lands occupy nearly a sixth of the department; and heaths, commons, and other open pastures more than a sixth. The number of cattle is great: those on the south bank of the Loire are considered to be of an excellent breed. The horses are small, but well made and spirited. Sheep are not numerous; but attention has been paid of late years to the improvement of the breed. Swine are numerous, and are fed on the acorns from the forests. The vineyards occupy nearly 75,000 acres; they extend all along the left or south bank of the Loire and the coast. The wine is chiefly white, and of middling quality. Apples, cherries, chesnuts, and other fruit are grown. Cider is made from the apple, and a drink resembling it from the service berry. Woods occupy about 80,000 acres: the oak is the principal forest-tree. Wolves, wild boars, and deer of different species are found in these woods. Poultry and bees are kept in considerable quantity. The rivers, the lake of Grand Lieu, and the smaller lakes or pools abound with fish; and the sardine, the sole, the ray, and other fish are caught on the coast. There are oyster-banks on the coast.

The department is divided into five arrondissements, as follows:—

		Area.	Population.		No. of
		Sq. Miles.	1831.	1836.	Communes.
Nantes	S.E.	685	205,627	205,892	66
Ancenis	E.	302	46,703	45,765	27
Châteaubriand	N.E.	539	62,242	62,275	37
Paimbœuf	S.W.	298	42,129	42,580	25
Savenay	N.W.	815	113,392	114,256	51
		2,639	470,093	470,768	206

It is subdivided into 45 cantons, or districts under a justice of the peace.

In the arrondissement of Nantes are—Nantes, at the junction of the Loire and the Erdre; Pont Rousseau, a suburb of Nantes, on the south bank of the Loire; Clisson, on the Sèvre Nantaise; Vallet (population 5967) and Lorroux-Bottereau (pop. 4991), between the Sèvre and the Loire; Vieillevigne (pop. 5451), on the Ognon; Legé (pop. 3213) on the Logne, St. Philibert (pop. 3200) on the Boulogne, and Machecoul (pop. 3665) on the Falleron. Nantes had, in 1831, a population of 77,992 for the town, or 87,191 for the whole commune; in 1836 it was reduced to 75,895 for the commune. [NANTES.] Clisson has the ruins of a castle in which the celebrated Oliver de Clisson, constable of France, was born: there is a fine view from these ruins. The town is at the junction of the Sèvre and the Moine; the townsmen (pop. 1928 town, 2432 whole commune) feed cattle and manufacture some linens. Near St. Philibert, on an island in the lake of Grand Lieu, is a Druidical monument; and not far from the adjacent shore of the lake another. The inhabitants of the neighbourhood have a tradition that the lake was formed by a terrible convulsion, in which a town called Herbadilla was swallowed up.

In the arrondissement of Ancenis are Ancenis, Oudon, and Varades (pop. 3506), on the Loire. Ancenis had, in 1831, a population of 3263 for the town, or 3749 for the whole commune; in 1836 it had decreased to 3667 for the commune. [ANCENIS.] Oudon has a lofty and picturesque octagonal tower, and the remains of a castle, said to have been built in the ninth century. The population of the whole commune is probably under 2000, and not above one-third is in the town itself. Varades is by some considered only a village: it is on a rising ground, on the north bank of the Loire, commanding the adjacent valley of that river. The ruins of an old castle crown the neighbouring eminence of La Madeleine. There are important coal-works at Montrelais, in this neighbourhood. They employed many years since about 300 men.

In the arrondissement of Châteaubriand are Châteaubriand, or Châteaubriant, on the Cher; St. Julien de Vouvantes, on the Don; and Nort (pop. 4751), on the Erdre; Châteaubriand had, in 1831, a population of 3027 for the town, or 3709 for the whole commune; in 1836 it had decreased to 3634 for the commune. The town is of antiquated appearance, and is commanded by the ruins of an old castle, the principal front of which formed part of the line of the ramparts. The townsmen manufacture 'sabots,' or wooden shoes, serges, tiles, and bricks; iron is procured in the neighbourhood. This place is noted for conserve of angelica and other confectionery. Several government and departmental roads converge here. Nort carries on some trade with Nantes, in coal from the neighbouring mines, wood for building and for fuel, and iron. At the village of Melleraie, between Châteaubriand and Nort, is a convent, now belonging to the monks of La Trappe; it was formerly a monastery of Bernardin monks. This community of Trappists consisted in 1819 of more than a hundred individuals, partly French and partly English. The English members had joined the community in their own country, where it was settled for some time. At Derval in this arrondissement are some Druidical stones. There was formerly a strong castle at this village.

In the arrondissement of Paimbœuf are Paimbœuf and Le Pellerin, on the south bank of the Loire; Port St. Père, on the Acheneau; St. Père en Retz, near Paimbœuf; Pornic and Bourgneuf on the sea; and Machecoul. Paimbœuf is situated in a low marshy flat; it consists of one main street, well built, with a quay along the bank of the Loire. It was, at the commencement of the last century, a hamlet of fishermen; but the increase of the trade of Nantes rendering it desirable to have a station lower down the river, where larger vessels might land or take in part of their equipment, Paimbœuf was chosen; and by the middle of the last century it had become, according to Expilly (*Dictionnaire des Gaules*, &c.), a village of 5000 to 6000 persons. Although it has since been constituted a town, and made the capital of an arrondissement, it seems to have declined; for the population, in 1836, was only 3872. Perhaps however Expilly's statement of the population is incorrect. There is a ship-building yard in the town, in which frigates have sometimes been built. Large vessels commonly and smaller ones frequently discha part of their cargoes at Paimbœuf, from whence they forwarded to Nantes in small craft. Bourgneuf (pop. estimated at about 2000), gives name to the bay at the bottom of which it is situated, and in which the sand and mud are gradually accumulating: the former port of Bourgneuf is now dry, except at high-water. A great deal of salt is made along the shore of the bay. Machecoul (pop. 3665) was formerly capital of the duchy of Retz, comprehending all (or nearly all) that part of the department which is south of the Loire.

In the arrondissement of Savenay are Savenay, on a little brook running into the Loire; Couéron (pop. 4053), Donges, and St. Nazaire, on the north bank of the Loire; Guérande and Le Croisic (pop. 2200 town, 2800 whole commune), on or near the sea; Pontchâteau, on the Elier de Mean or Brivé; Blain (pop. 4899), on the Isaac; and Herbignac. Savenay had, in 1836, a population of 2079 for the commune. There are salt-works in the marshes near the town, and the townsmen carry on considerable trade in cattle. At St. Nazaire (pop. 3789) is a singular monument, probably Druidical. Loadstones are found, and peat is dug in the neighbourhood of this town. Guérande (pop. 2041 town, 8190 whole commune) is more populous, wealthy, and commercial than Savenay: there are salt-works here. At Pontchâteau (pop. 3300) a large quantity of wash-leather is manufactured. Blain is described elsewhere. [BLAIN.]

The population, when not otherwise distinguished, is that of the whole commune, and is from the census of 1831.

The manufacturing and commercial activity of this department is considerable. Salt-works are numerous; and there are iron-works. Porcelain, glass, earthenware, pottery, and tiles; bed-ticking and serge in considerable quantity; cotton goods, leather, hats, rope, paper, corks, brushes, brandy, and chemical articles, are made: ship-building, both for the merchant service and for the navy, except ships of the line, is carried on; and the cod, herring, and coast fisheries employ many hands. Trade is carried on from the ports of Nantes and Paimbœuf with all parts of the world; and the navigation of the Loire and its tributaries affords considerable facilities for inland trade.

This department forms the diocese of Nantes, the bishop of which is a suffragan of the archbishop of Tours. It is in the jurisdiction of the Cour Royale, and the circuit of the Académie Universitaire of Rennes; and is included in the twelfth military division, the head-quarters of which are at Nantes. It returns seven members to the chamber of deputies.

In respect of education this department partakes of the backwardness which characterises the whole of Bretagne. Of the young men enrolled in the military census of 1828-29, only twenty-four in every hundred could read and write; the average of France was above thirty-nine in every hundred.

This department constituted the territory of the Namnetes, or Nannetes (*Ναμνιται*, Strabo; *Ναμνηται*, Ptolemy), one of the Celtic nations conquered by Cæsar. They formed part of the Armorican confederacy broken and subdued by that conqueror in the third year of his command. That part of the department which lies south of the Loire was included in the territory of the Pictones or Pictavi, another Celtic people. In the Roman division of Gaul the territory of the Namnetes was included in Lugdunensis Tertia; that of the Pictones in Aquitania Secunda. Condivicnum, or Condevicnum, the capital of the Namnetes, took in the later period the name Namnetes, or Nannetes, whence its modern name Nantes. Corbilo, another town of the same people, mentioned by Strabo, was on the north bank of the Loire, perhaps on the site of the present Couéron. Ratiatum, a town of the Pictavi, is fixed by D'Anville at St. Pierre, or St. Père en Retz. The district of Retz takes its name from Ratiatum. The department constituted in the middle ages a portion of Lower Bretagne, and partook of the fate of that province. [BRETAGNE.] The western part about Pont Château constituted the duchy of Coislin; the western part south of the Loire constituted the duchy of Retz.

LOIRET, a department in the central part of France. It is bounded on the north by the department of Seine et Oise; on the north-east by that of Seine et Marne; on the east by that of Yonne; on the south-east, for a short space, by that of Nièvre; on the south by that of Cher; on the south-west by that of Loir et Cher; and on the north-west by that of Eure et Loir.

Its form is that of an irregular oval; its greatest length is from west-north-west to east-south-east, from between Orléans and Châteaudun (Eure et Loir), to the neighbourhood of Bonny on the Loire, 73 miles; its greatest breadth, at right angles to the length, is from the neighbourhood of Malesherbes to that of La Ferté-Senneterre, 51 miles. Its area is estimated at 2585 square miles, which is above the average of the French departments, and is exactly equal to that of the English county of Devon. The population in 1831 was 305,276; in 1836 it was 316,189; showing an increase in five years of 10,913, or above three and a half per cent., and giving 122 inhabitants to a square mile. This department is below the average of France both in amount and density of population, and very far below the English county with which we have compared it. Orléans, the capital, is in 47° 54′ N. lat. and 1° 54′ E. long., 67 miles south by west of Paris in a direct line, or 71½ miles by the road through Etampes.

The hills that branch off from the prolongation of the Cévennes in the neighbourhood of Autun, and extend north-westward, separating the basin of the Loire from that of the Seine, enter this department on the south-east side, and extend for some distance along the northern bank of the Loire, subsiding near the source of the Vernisson, a feeder of the Seine, which rises within three or four miles of the banks of the Loire. The hills of the forest of Orléans, part of the heights of Beauce, a range of high lands branching from the Armorican mountains, enter this department on the north-west side, and advance to meet the range of hills just described. They are separated only by the intervening valley of the Vernisson. Some maps represent the two as forming one continuous range. With the exception of these low hills the surface is tolerably level.

The greater part of the department is occupied by the supracretaceous rocks belonging to the chalk-basin of Paris. These occupy the valley of the Loire for a short distance on each side of the river; and extend over all the country northward of the Loire and westward of the Loing. The districts east of the Loing and south of the Loire are occupied by the chalk which surrounds the Paris basin, except for a short distance from the banks of the Loire on each side of the river where the chalk is covered by supracretaceous rocks. The only minerals are building-stone and potters' clay.

The principal river is the Loire, which is navigable throughout. It enters the department at Bonny, and flows north-west by Briare, Gien, and Jargeau to Orléans, gradually bending to the west, so that at Orléans its course is nearly from east to west. From that city it gradually bends to the south-west, and passing Meung and Beaugency, enters the department of Loir et Cher. Its length in this department may be estimated at about 80 miles. Several small streams join the Loire on each side. The Loiret, though it gives name to the department, is scarcely more than six or seven miles long. Its springs however supply such an abundance of water as to render it navigable for two miles and a half. It is never entirely frozen over.

The other rivers belong to the system of the Seine, in the basin of which the northern part of the department is included. The Loing, a tributary of the Seine, rises in the department of Yonne, enters this department on the east side, and flows northward by Montargis into the department of Seine et Marne; of its whole course, which may be estimated at more than 70 miles, nearly 30 miles are in this department. The Aveyron and the Ouanne, tributaries of of the Loing, have their source in the department of Yonne, but join the Loing in this department, to which about 17 miles of the course of the Ouanne, the larger of the two, belong.

The canal of Orléans begins in the Loire, a little above that city, and runs north-east to the valley of the Moulon, a feeder of the Loing, along which it proceeds until it joins the canal of the Loing near Montargis. The length of this canal may be estimated at 45 miles. The canal of Briare commences in the Loire at Briare, and runs northward, but by a circuitous course along the valley of the Loing, first on the right, then on the left bank of the river, to Montargis: its length may be estimated at nearly 35 miles. It crosses a projecting portion of the department of Yonne; otherwise it belongs entirely to that of Loiret. The canal of the Loing commences at Montargis, where it communicates with the two above-mentioned canals, and follows the valley of the Loing, first on the left bank, then along the bed, then along the right bank, and again along the bed of the river till its junction with the Seine at Moret. Of its whole length, which may be estimated at about 33 miles, about 11 or 12 belong to this department. Of the lateral canal of the Loire, formed from Digoin to Briare, to avoid the natural difficulties of the navigation of the river, about 11 miles are in this department.

There are in the department nine Routes Royales, or government roads, having an aggregate length of 269 miles, viz. 158 in repair, 63 out of repair, and 48 unfinished (1 Jan. 1837). A road runs from Paris to Orléans: it enters the department at Artenay, and runs direct to Orléans. From Orléans two roads run, one along the north bank of the Loire, by Meung and Beaugency, to Blois (Loir et Cher), and Tours (Indre et Loire); the other, crossing the Loire by the bridge at Orléans, runs south to Châteauroux and Limoges. Another road from Orléans follows the north bank of the Loire to Gien and Briare, when it falls in with the high road from Paris to Nevers (Nièvre) and Moulins (Allier). Other roads run from Orléans, by Montargis, to Courtenay in the north-east part of the department, and to Châteaudun in the department of Eure et Loir. The main road from Paris to Nevers and Moulins, and from thence to Lyon on one hand and Clermont on the other, enters the department on the north side, near Ferrières, and runs south by Montargis to Briare, where it unites with the road from Orléans to Nevers. The Routes Departementales (departmental roads), fourteen in number, have an aggregate length of more than 250 miles, of which about two-thirds are in repair, the rest out of repair or unfinished. The bye-roads and paths exceed 12,000 in number, and have an aggregate length of above 12,000 miles.

About one-sixth of the soil consists of rich loam, and about as much of gravelly or stony land, or of uncultivated heath or other waste; the remaining two-thirds consist almost entirely of a light sandy soil. The produce in grain, especially oats, is very considerable, and far exceeds the consumption of the department. Almost two-thirds of the land are arable. A considerable quantity of pulse, fruit, saffron, flax, hemp, and colza, are raised. The banks of the Loire, between Briare and Orléans, constitute one of the most sterile portions of the department. The hills of Beauce, which rise to the northward of this barren tract, are covered with vineyards: the red wines which they produce are of excellent quality; the white wines are very poor. The quantity of horned cattle is considerable; sheep of English breeds and merinos have been naturalised with success. The quantity of meadow-land is about 60,000 acres; the extent of the commons and other open pastures is about 140,000 acres. A great quantity of poultry, especially turkeys, is bred for the supply of Paris. Bees are numerous in the hills of Beauce, and the honey is considered excellent. The rivers, with the numerous étangs or pools, supply the neighbouring departments with fresh-water fish. The quantity of woodland is considerable, amounting to nearly one-sixth of the whole department. The principal forests are those of Orléans in the centre, and of Montargis in the eastern part of the department.

The department is divided into four arrondissements, as follows:—

	Situat.	Area in Sq. Miles.	Population. 1831.	1836.	Communes.
Orléans	W.	929	137,820	141,637	106
Pithiviers	N.	459	60,039	60,628	98
Gien .	S.	570	41,273	43,643	49
Montargis	E.	627	66,144	70,281	95
		2585	305,276	316,189	348

The number of cantons, or districts under a justice of the peace, is 31.

In the arrondissement of Orléans are Orléans (pop. in 1831, 40,161; in 1836, 40,272) [ORLEANS]; Châteauneuf (pop. 2864 town, 3160 whole commune); Meung (pop. 2589 town, 4630 whole commune); and Beaugency (pop. 4182 town, 4883 whole commune), all on the north bank of the Loire; Jargeau, Mesnin, and Notre Dame de Cléry, on or near the south bank; Olivet on the Loiret; Patay near the Connie, a feeder of the Loir; Neuville near the source of the Œuf or Essone, a feeder of the Seine; and Artenay, on the road from Paris to Orléans. Châteauneuf has some manufactures of coarse woollens and linens. Meun, or Meung, has an antient palace, formerly belonging to the bishops of Orléans. The inhabitants of the town are engaged in tanning and paper-making, in the cultivation of the vine, and in fishing. There are many corn-mills. It was the native place of Jean de Meun, a poet of the middle ages, of some repute at the court of Philippe le Bel. The town was several times taken in the wars with the English, and in the civil dissensions of the sixteenth century. Beaugency has a bridge of thirty-nine arches over the Loire. The townsmen manufacture serges, hats, and leather. There are several distilleries. The wines of the neighbourhood, as well as of Meun, are excellent, and furnish a considerable article of trade. Jargeau was taken by the English in the war under Henry V. and VI., and retaken in the year 1429. Notre Dame de Cléry has a church, formerly collegiate, with a lofty spire, which at a distance forms a striking object. Louis XI. rebuilt this church, which had been destroyed by the English, and directed that his body should be buried there instead of at St. Denis. His request was complied with; and his tomb, which had been removed during the Revolution to Paris, was replaced in its former situation after the restoration of the Bourbons. It was at one time much resorted to, from the fame of the miracles which the Virgin was supposed to work there. At Olivet the great Duke of Guise was assassinated by Poltrot, as he was preparing to form the siege of Orléans. Patay was the scene of the first pitched battle won by the French over the English, after the appearance of Jeanne d'Arc had turned the tide of success.

In the arrondissement of Pithiviers are Pithiviers (pop. in 1831, 3882 town, or 3957 whole commune; in 1836, 4023 commune) and Malesherbes, on the Œuf, or Essone; Puiseaux (pop. 1876 town, 1970 whole commune), between the Essone and Suzain, a feeder of the Loing; Beaune and Boiscommun on the branches of the Suzain; and Achère, or Asheres le Marché. Pithiviers is well known for its almond-cakes and its lark-pies, of which a considerable number are sent to Paris. Considerable trade is also carried on in cattle, wine, vinegar, honey, and saffron. The town has three yearly fairs. The saffron grown round Pithiviers is considered the best in Europe. Building-stone, which takes a polish almost equal to marble, is quarried in the neighbourhood. Malesherbes was the lordship of one of the ministers and the defender of Louis XVI. on his trial before the Convention. Puiseaux was nearly destroyed by a flood in A.D. 1698: 150 houses were overthrown, and 100 lives lost, besides much cattle.

In the arrondissement of Gien are Gien (pop. in 1831, 4631 town, 5177 whole commune; in 1836, 5330 commune), Briare (pop. 2243 town, 2730 whole commune), and Bonny, all on the north bank of the Loire; and Beaulieu, Châtillon sur Loire, St. Goudon, and Sully, on the south bank. Gien has a handsome bridge over the Loire. The chief, if not the only manufacture, appears to be that of superior earthenware: there is also some trade in wool and leather. Briare consists of one main street, straight and tolerably well built; and is chiefly inhabited by the boatmen who work on the Loire, or on the Canal de Briare, which here opens into that river. A considerable trade, especially in wine, is carried on, which is promoted by the situation of the town at the junction of the Canal de Briare with the Loire. Bonny, or Boni, is a tolerably good looking town, about the same size as Briare. Sully has a handsome château and a church formerly collegiate. It gave the title of duke to Maximilian de Bethune, minister of Henri IV. The population of the commune at the commencement of the present century was 2500.

In the arrondissement of Montargis are Montargis (pop in 1831, 6781; in 1836, 7757), Châtillon sur Loing (pop 1721 town, 2126 whole commune), and Ferrières, all on or near the Loing; Courtenay on the Clery, a feeder of the Loing; Château Renard, on the Ouanne; and Lorris, on the Casseau, one of the affluents of the Moulon, which flows into the Loing. The origin of Montargis is not known, but the remains which have been discovered show it to have been a place of some note in the time of the Romans. There are some bridges over the Loing. Towers called 'the towers of Chenevières;' the remains of a circus near them; and a military way, still called 'Cæsar's road,' which are of Roman origin: and in 1725 the remains of a portico with a mosaic pavement were discovered. The town is small, but pleasantly situated in the midst of meadows: it is walled and had an antient castle built by Charles V., in which, on account of the purity of the air, the queens of France we accustomed to lie in. In this castle was formerly sh the portrait of a celebrated dog, who, according to tradi pointed out the grave and overcame in a legal combat the assassin of Aubry de Mondidier, his master. The incident was dramatized and performed with considerable success at the minor theatres of London some years since, under the title of 'The Dog of Montargis, or the Forest of Bondy.' The castle was pulled down about A.D. 1810. The streets of Montargis are broad and straight, but the houses are ill built. The only parish church, that of La Madeleine, in the middle of the town, is much admired for its architecture. There are two large paper-mills forming one establishment about a mile from the town: in the same establishment woollen rags are reduced to the state of wool for the purpose of being again spun and woven. The trade of Montargis is promoted by the canals of the Loing, of Orléans, and of Briare, which unite near the town; the chief articles of trade are cattle, corn, wine, wood, and wool. The exhalations from these canals have caused a deterioration in the air of the place, once so famous for its purity and healthfulness. Montargis has a handsome theatre, one or two subordinate courts of justice, and an agricultural society. This town was besieged by the English, A.D. 1427, but the siege was raised, and the besieging force entirely defeated by Dunois, bastard of Orléans. It was however taken by the English in A.D. 1431, and retained by them till A.D. 1438. Montargis was the birth-place of the quietist Madame La Motte Guyon, whose poems were translated by Cowper, and of Manuel, procureur or attorney of the commune of Paris in the French revolution. Châtillon sur Loing was the birthplace of Admiral Coligny. Château Renard was one of the strongholds of the Huguenots in the religious wars of the sixteenth century: its fortifications were on that account demolished by Louis XIII. Lorris was formerly distinguished by a recognised custom of deciding all questions of disputed debts, in the absence of documentary evidence, by single combat between the debtor and creditor; if gentlemen, with swords; if of inferior rank, with fists.

Near the village of Nogent sur Vernisson are some remains of a Roman town or post, the name of which is unknown. The principal relic is a theatre, in the enclosure of a château, called Chenevier. The benches or seats are formed of small cubical stones, similar to those employed in several Roman edifices. Several medals, a bronze Mercury, and other antiquities have been discovered; and in the neighbourhood of the theatre, in a thicket, are some remains supposed to be those of baths. These antiquities have been but little noticed by the French antiquaries.

The manufactures of the department are considerable. The wool of Beauce and Sologne is made up into various fabrics: parchment and hosiery are manufactured; and sugar refining, vinegar-making, and the distillation of brandy are carried on to a considerable extent. Trade is carried on in the agricultural produce, grain, wine, and timber; in brandy, earthenware, and moulds for the sugar-refiners.

The department constitutes the diocese of Orléans, the bishop of which is a suffragan of the archbishop of Paris. It is in the jurisdiction of the Cour Royale and in the circuit of the Académie Universitaire of Orléans: and in the first military division, the head-quarters of which are at Paris. It returns five members to the Chamber of Deputies.

In respect of education this department is rather above the average of France: the number of young men in the military census of 1828-29 who could read and write was forty-two in every hundred; the average of France being rather more than thirty-nine.

This department formerly constituted part of the territory of the Carnutes, one of the Gallic nations of Celtic stock. In the Roman division of Gaul it was comprehended in Lugdunensis Quarta. Genabum, or Cenabum, the modern Orléans, was one of the chief trading stations of the Carnutes. This town took at a subsequent period the name of Aureliani, probably from the emperor Aurelian. A town is mentioned in the Itinerary of Antoninus by the name of Belca, which is probably the present village of Bouzi, on the left of the road from Orléans to Gien. A part of the territory of the Senones, another Celtic people, is included in the department: Brivodurum, the modern Briare, was one of their towns. In the decline of the Roman Empire, this department was ravaged by the Huns; and afterwards divided between the Franks and the Visigoths, whose territories were separated by the Loire. It subsequently came altogether into the hands of the Franks, and in the division of their territories among the sons of Clovis, formed part of the kingdom of Orléans. It was included in the great Duchy of France united to the crown by Hugues Capet. [ORLEANS.] It comprehends Orléanais proper, with part of Gâtinois and Dunois, subdivisions of the province of Orléanais; also a part of the former province of Berri.

LOKMÂN is represented in the Koran and by later Arabian tradition as a celebrated philosopher, contemporary with David and Solomon, with whom he is said to have frequently conversed. He was, we are told, an Arabian of the antient tribe of Ad, or, according to another account, the king or chief of that tribe, and when his tribe perished by the Seil-ol-Arim [ARABIA, vol. ii., p. 215] he was preserved on account of his wisdom and piety. Other accounts, drawn mostly from Persian authorities, state that Lokmân was an Abyssinian slave, and as noted for his personal deformity and ugliness, as for his wit and a peculiar talent for composing moral fictions and short apologues. He was considered to be the author of the well known collection of fables in Arabic, which still exist under his name. There is some reason to suppose that Lokmân and Æsop were the same individual. This supposition is founded on the close correspondence of the traditional accounts of the person, character, and life of Lokmân, with those of Maximus Planudes respecting Æsop. [ÆSOPUS, vol. i., p. 155.] Even the name of Lokmân may, by a slight transposition, be derived from the Greek Alkman. If Lokmân is not altogether a fictitious person, his history seems to have been mixed up with that of Æsop. The monk of Constantinople probably engrafted many incidents of his life on the few circumstances recorded by the classic writers respecting that of the Greek fabulist. He may have been induced to do it by the apparently Asiatic origin of Æsop and the derivation of his name (from *αἴθω* and *ὤψ*, which to a Greek would seem no forced derivation), and this assumed Asiatic origin might afterwards give rise to his dull buffooneries, his bodily defects, and Æthiopic extraction.

The fables of Æsop have by no means the character of antient and original Greek compositions. Many of them are strongly marked with an Oriental character. They bear a very striking resemblance to the Indian fables in the 'Panchatantra;' they allude to Asiatic manners and customs; and animals are mentioned in them, which are only found in Upper Asia, as monkeys, peacocks, &c. In the fables of Lokmân the same peculiar features frequently occur. Hence we may safely infer that both collections were originally derived from one common source, the Indo-Persian entertainment of this description: from this source certainly came the fabulous work attributed to Syntipas (who was no other than the Sindbad of the 'Arabian Nights'), and other works of that kind, which during the middle ages so powerfully attracted the attention of Europe.

(See Boissonnade, *Præf. ad Syntipam*, p. vi.; Grauert, *De Æsopo et Fabulis Æsopicis*, Bonnæ, 1825.)

The fables of Lokmân show, in many instances, evident marks of a later and traditional origin; the moral or application is frequently misunderstood, or at least ill adapted to the apologue; a few antient expressions had then become obsolete and are interpreted by words of more modern origin; and the language in general exhibits some slight deviations from grammatical accuracy, and approaches nearer to the modern Arabic idiom; as for instance, in the use of the oblique case instead of the first case. The style is easy and flowing. The fables have often been reprinted for the use of those who are beginning to study the language, after the first edition with a Latin interpretation, by Erpenius, Lugd. Batav., 1615, the best and latest editions are by Cousin, Paris, 1818; Freytag, Bonnæ, 1823; and Roediger, Halis, 1830.

LOLI'GO. [SEPIADÆ; TEUTHIDÆ.]

LOLIGOPSIS. [SEPIADÆ; TEUTHIDÆ.]

LO'LIUM, a genus of Grasses, containing a few species common in many parts of the northern hemisphere, is defined as follows:—Spikelets many-flowered, distichous, contrary to the rachis, sessile. Flowers not bearded at the base. Glumes 2, nearly equal, one of them very often deficient in the lateral spikelets, herbaceous, awnless. Paleæ 2, herbaceous; the lower concave and awnless, or awned under the apex; the upper with two keels. Stamens 3. Ovary smooth. Styles 2, very short. Stigmas feathery. Hypogynous scales 2, fleshy, entire or two-lobed. Rachis not jointed. There are two species which require notice. 1, *L. perenne*, the common Ray-grass, or Rye-grass of the farmer, with lanceolate awnless spikelets which are longer than the glume, a naked stem, and a perennial root. Of this, which is one of the most valuable of our pasture grasses, an account is given elsewhere. [Rye-grass.] 2, *L. temulentum*, or darnel, with elliptical awned spikelets, straight awns longer than the paleæ, glumes the length of the spikelet, and an annual root. Of this species mention is made not only in all parts of Europe, but in Japan, New Holland, China, and Monte Video; it is remarkable as being the only well authenticated instance of a plant belonging to the order of Grasses, in which narcotic or even deleterious properties have been found. The grains are said to produce intoxication in man, beasts, and birds, and to bring on fatal convulsions. According to Christison, darnel, when mixed with flour and made into bread, has been known to produce headache, giddiness, somnolency, delirium, convulsions, paralysis, and even death. A few years ago, the same author tells us, almost the whole of the inmates of the Sheffield workhouse were attacked with symptoms supposed to be produced by their oatmeal having been accidentally adulterated with Lolium; and a case is on record of a small farmer near Poitiers in France having killed himself by persevering in the use of darnel flour for making bread; his wife and servant, who discontinued to eat it, escaped, but were violently affected with vomiting and purging.

LOLLARDS, a religious sect which arose in Germany at the beginning of the fourteenth century, and differed in many points of doctrine from the church of Rome, more especially as regarded the mass, extreme unction, and atonement for sin. It took its name, according to some writers, from Walter Lollard or Lolhard, who was burnt alive for these doctrines at Cologne in 1322; but it would seem that Walter rather received his name from the sect, than gave a name to it. The real origin of the term appears to be the German *lullen*, *lollen*, or *lullen*, to sing, with the well-known termination of *hard* which is subjoined to so many German words; and it implied a person who was continually praising God in sacred songs. Lollard subsequently became a term of reproach for all heretics, who were supposed to conceal erroneous doctrines under the appearance of piety; and, in England, at the close of the fourteenth century, it was given to the followers of Wicliffe. Knighton, noticing the success of that reformer's doctrines (*Twysd. Script.* x. col. 2664) says, 'more than half of the people of England in a few years became Lollards.'

Mosheim, in his 'Ecclesiastical History' (b. iii., part ii., ch. 2), observes, 'Charles, duke of Burgundy, obtained a decree from Sixtus IV., in the year 1472, by which the Cellitæ or Lollhards were admitted among the religious orders, and were withdrawn even from the jurisdiction of the bishops; and Julius II., in the year 1506, conferred on them still greater privileges. Many societies (he adds) of their kind still exist at Cologne and in the cities of the Netherlands, though they have essentially departed from their antient manner of life.' This, of course, was previous to the French Revolution. (Furetiere, *Dictionnaire Universel*; Mosheim, *Institutes of Ecclesiastical History*, by Murdock, 8vo., Lond., 1832, vol. ii., p. 454-456.)

LOMATO'CERAS. M. Bronn has given this name to a generic group embracing certain of the Linnæan Graptolithi [Graptolithus] instead of Priodon, which had been assigned to them by Nilson, but previously employed by Cuvier for a genus of fishes. Graptolithus scalaris and G. sagittarius, Linn., belong to this group, which as far as yet known is confined to the 'transition strata,' in which it occurs in Norway, Bohemia, France, North Germany, Shropshire, &c., generally accompanying trilobites. (Bronn, *Lethæa Geognostica.*)

LOMBARD, an antient name in England for a banker. It was derived from the Langobardi, or Lombards, a company of Italian merchants, the great money-changers and usurers of the thirteenth century, who appear to have settled in England before the year 1274, and took up their first residence in a street of the city, still called, from them, Lombard Street.

Stowe, in his 'Survey of London,' 4to., 1603, p. 202, says, 'Then have ye Lombard Streete, so called of the Longobards and other merchants, strangers of diverse nations, assembling there twise every day. The meeting of which merchants and others there continued until the 22nd of December in the year 1568, on the which day the said merchants began to make their meetings at the Bursse, a place then new builded for that purpose in the warde of Cornhill, and was since by her majestie Queen Elizabeth named the Royal Exchange.'

The extortions of the Lombard merchants in King Edward III.'s time became so great that he is stated to have seized upon their estates. They continued however to follow their trade: and when Henry VI. borrowed money of them, they had the customs mortgaged to them for security.

(Du Cange, *Gloss.* v. 'Langobardi;' Pennant's *Hist. of Lond.*, edit. 1790, p. 407; Nares's *Glossary.*)

LOMBARDIC ARCHITECTURE. This style, which has already been touched upon in the article Gothic Architecture (vol. xi., p. 320), may claim to be considered the generic one which prevailed after the extinction of the Roman until the appearance of the Pointed or Gothic. It is the intermediate link between them, but so united with them that it is difficult to fix with precision where it begins or where it terminates. Yet although the same elements, variously modified indeed, may be traced in our Saxon or Early Norman and Norman styles, and also in the contemporary styles of other countries, the term is usually restricted to the Italian architecture of the period alluded to, which, if it has something in common with those collateral styles, namely, what they borrowed from it, possesses also much that is sufficiently distinct, and that marks it as a separate class. In the degenerate Roman architecture the rudiments of a new style were beginning to develop themselves, owing to the almost general application of the arch, both as a constructive and ornamental feature, and also to the subordinate rank assigned to columns, which, besides being engaged, or partly inserted into the wall, were greatly diminished in size, that is, although they retained the same proportions as before, they were upon a comparatively diminutive scale in proportion to the edifice itself, each story being, as in the Colosseum, decorated with its own order. Consequently, though nominally no change had been made, in reality a great revolution in art had been effected.

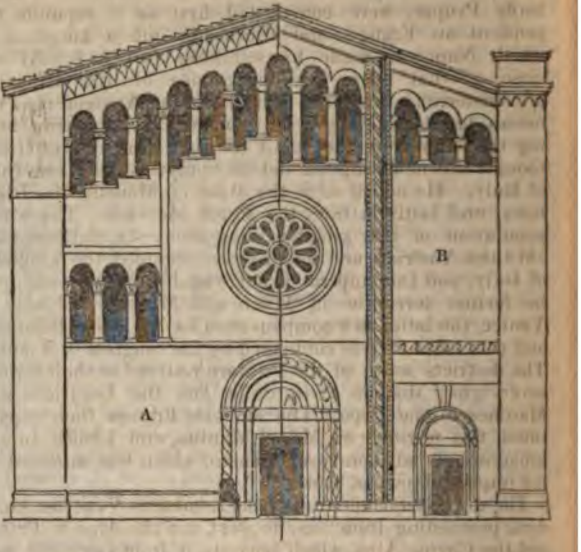
Notwithstanding therefore that we are accustomed to regard the Lombardic historically as altogether another style, it does not present much greater discrepancy of character from that which it supplanted than the latter does from the earlier Greco-Roman. In fact it was only a further development of the system introduced during the decline of Roman architecture, and so far more consistent and homogeneous than the other, which exhibited the attempt to reconcile discordant features and conflicting principles, namely, small orders applied merely as decoration, and tiers of arches whose piers form the solid parts and supports of the structure. Whether it was the result of chance, caprice, or necessity, or of all three, the Lombardic style reconciled these two contradictory modes by combining together the arch and the column, and rendering the latter the essential support of the former. It is true, arches resting upon insulated columns occur in buildings of the *Decadence* period, for instance, in what are now the churches of Sta. Costanza and Santo Stefano Rotondo, at Rome; but in such cases, instead of springing immediately from the capitals of the columns, the arches rest upon a piece of entablature forming a square block above the capital (which practice has been copied in the interior of St. Martin's church, London). The discarding all appearance of entablature was undoubtedly an improvement, since such detached fragments of it served only to render the impropriety—supposing there to be any—of placing arches upon columns all the more glaring, because indicating what ought to be a continuous horizontal member. At first the columns themselves were mostly tapering, not cylindrical as the slender detached ones met with in the Pointed style, and the capitals bore a more or less close resemblance to those of the Corinthian order in contour and proportion. The capital itself however was larger in proportion to the rest of the column, thereby affording a greater surface or impost for the arches to rest upon; and also combining the appearance of security at that point with general lightness of appearance. The shaft was mostly plain, yet frequently highly ornamental, striated or carved in different ways, and sometimes twisted, either singly or with two stems twining spirally around each other. Columns furnishing examples of all these different modes occur in the cloisters of San Paolo and San Giovanni Laterano at Rome, and the capitals present quite as much variety, it seeming to have been the aim on such occasions to introduce as much diversity as possible, instead of so arranging the columns as to have two of the same kind placed together; a practice probably originating in making use of columns and fragments taken from other buildings; and afterwards retained as conducing to variety and richness.

Although the arches were, as frequently as not, quite plain, and without archivolt mouldings of any kind, the use of archivolts was by no means uncommon; sometimes consisting of merely a single moulding enclosing a plain border around the arch, at others divided into *faciæ*, and more or less enriched, as in the front of the cathedral of Pisa, in which building the arches describe more than a semicircle above the capitals of the columns, being prolonged downwards by a deep abacus, consisting in some places of two, in others of a single plain block resting immediately on the capital; a mode certainly preferable to that of placing a mere lump of entablature upon the column, and not ungraceful in itself, because it gives greater height and importance to the arches, which, being narrow, would else appear stumpy, depressed, and overloaded by the ornament around them. Similar blocks or *abaci* occur in the remains of Frederick Barbarossa's palace at Gelnhausen, where small heads or masks are introduced immediately above such abaci, so as to fill up the space there between the arches, and continue in some degree the vertical lines produced by the columns.

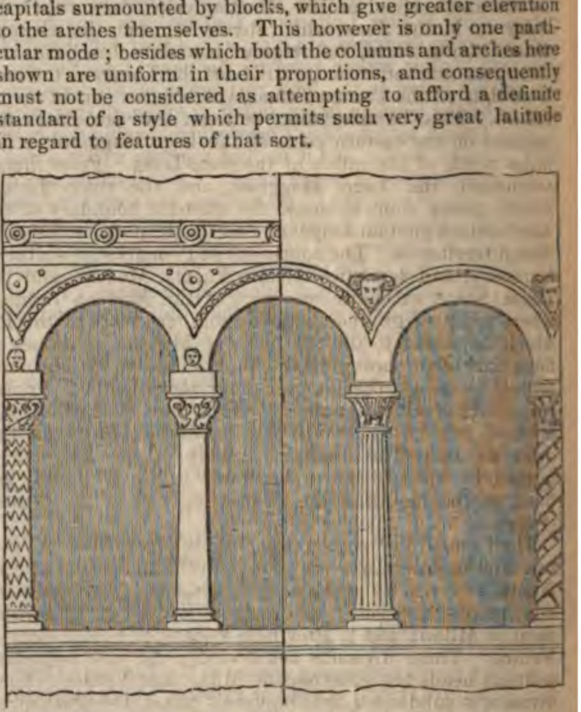
Among the other more prominent characteristics of this style, which are all that we can here touch upon, it should be noticed, that whether forming actual porticos and galleries, or closed up and applied merely as decoration, these arcades were generally small in proportion to the building itself, and instead of occupying the entire width of the front, or other elevation, were mostly inserted into distinct compartments of it, slightly recessed within the general face of the wall, so that the plain spaces between them assumed the appearance of buttresses, or, when narrow, of plain pilasters continued up to the cornice of the gable or roof, and cutting through whatever string-courses, or other horizontal mouldings (if there were any), divided the different stories or stages of the edifice. Such buttress-like surfaces—for buttresses they cannot properly be termed—were occasionally more or less enriched; sometimes so much so, as to produce vertical lines of ornament continued the entire height of the building, as in the front of San Michele at Pavia—which city may be considered as the cradle of Lombardic architecture. When, as was frequently done, these surfaces were made wider at the angles of the front than elsewhere, they gave an expression of repose and of great solidity to it, serving as it were as a frame to the architectural decoration.

Among the other peculiarities of this style, that arising from small open galleries immediately beneath the cornice or roof is too remarkable to be overlooked, especially in gable fronts, where the arches of such galleries follow the slope of the roof itself, the columns being successively elevated one above another on steps (so that the base of those supporting the centre arch are above the lower arches), as at San Michele, just mentioned; or else by placing the columns on the same horizontal line, and gradually increasing their height, as in the front of Pisa cathedral. To this may be added the very prevalent custom of making an upper cornice or border of very small interlacing arches, or rather of mouldings producing that appearance. Pinnacles are of rare occurrence, and when introduced have the look of being set on the part they rise above, being separated from it by horizontal mouldings; besides which they are generally low, and somewhat resemble pedestals. Pinnacles of this description may be found surmounting pilaster-breaks, and cutting through either an horizontal cornice or the sloping ones of a gable, as in the front of the cathedral at Monza.

To render the above slight account of this mediæval Italian style more intelligible, some of its elements and leading forms are here indicated in a sketch exhibiting two different compositions of a façade; the half front marked A showing the columns of the arcade in the gable all of the same height, but placed on different levels; while that marked B represents them standing on the same horizontal line, and consequently unequal in height. The side B also shows a variation in regard to the form of the gable, which, instead of extending the whole width of the front, takes a horizontal direction over the pier at the angle. An enriched pilaster face is also introduced in this division of the cut, and, although rather peculiarly applied, is warranted by the authority of San Michele at Pavia. A very imperfect idea however is thus conveyed of the variety of features, combinations and proportions which the style itself admits.



The other cut gives an example of an arcade on a larger scale, with columns variously ornamented, and having their capitals surmounted by blocks, which give greater elevation to the arches themselves. This however is only one particular mode; besides which both the columns and arches here shown are uniform in their proportions, and consequently must not be considered as attempting to afford a definite standard of a style which permits such very great latitude in regard to features of that sort.



LOMBARDO VENETIAN KINGDOM, REGNO LOMBARDO VENETO, is a state of North Italy, composed of the former duchies of Milan and Mantua, and of the territory of the late republic of Venice. The duchy of Milan came into the possession of Charles V. in 1535, after the death of the last duke Sforza, who left no issue. [LOMBARDY.] Charles V. left it to his son Philip II. of Spain; and it remained under the Spanish branch of the house of Austria for a century and a half, until the extinction of that branch, when by the result of the war of the Spanish succession it passed under the dominion of the German branch of the house of Austria. The duchy of Mantua was governed for a long time by the Gonzaga as a fief of the empire, but the last duke, Ferdinand, having sided with the French during the war of the Spanish succession, the emperor Joseph I. put him under the ban of the empire, and the Austrian troops having taken Mantua, the emperor annexed it to the duchy of Milan. Austria continued to govern these united states till Bonaparte's invasion of 1796. By the peace of Campoformio of the following year Austria gave up Milan and Mantua, and received as a compensation for them and Belgium, which was also taken from her by the French, the territory of the republic of Venice, which

Bonaparte had overthrown. Milan and Mantua, or Lombardy Proper, were constituted first as a republic dependent on France, and afterwards into a kingdom, of which Napoleon made himself king in 1805. At the close of that year, in consequence of the campaign of Austerlitz, Napoleon retook from Austria the Venetian territories, which he annexed to Lombardy, styling the whole by the name of the kingdom of Italy, though this new kingdom did not comprise above one-third of Italy. He added to it the state of Modena, the Legations, and lastly in 1808 the Papal Marches. The whole population of this kingdom was about six millions. In 1814 the Austrian and allied forces occupied the kingdom of Italy, and the emperor Francis again took possession of his former territories of Milan and Mantua, and also of Venice, the latter as a compensation for his loss of Belgium; and this measure was confirmed by the congress of Vienna. The districts south of the Po were restored to their former sovereigns; Modena to its duke, and the Legations and Marches to the Pope. The emperor Francis then constituted the territory of Milan, Mantua, and Venice into a kingdom, styled Lombardo-Veneto, which was annexed to the imperial crown of Austria.

The northern boundaries of the Lombardo-Venetian kingdom, proceeding from east to west, are the Alps of Friuli, and the Carnic Alps, which separate it from Carinthia and Carniola, and several offsets of the Rhætian Alps, which divide it from the Tyrol; farther to the north-west it is bounded by the main chain of the Rhætian Alps, from the Ortler Spitz to Monte Jorio, which divide it from the Grisons. From Monte Jorio, an irregular boundary line, not very definitely marked by nature, divides the Lombard territory from that of the Canton Ticino, which forms part of Switzerland. This boundary-line between the two states terminates on the eastern coast of the Lago Maggiore, a few miles north of the influx of the river Tresa. From thence southward, the Lago Maggiore, and the river Ticino, which issues from it, mark the western boundary of the Lombardo-Venetian kingdom, and divide it from the Sardinian territories. The course of the Po marks its southern boundary, and separates it from Parma, Modena, and the Papal State, except in one part of the Modena frontier, where a slip of ground along the southern bank of the Po, which belonged to the old duchy of Mantua, continues to form part of the present Austrian Lombardy. In the delta formed by the Po, the branch of that river called Po d'Ariano, the mouth of which is named Porto di Goro, marks the limits between the Austrian and Papal territories. [FERRARA, LEGAZIONE DI.] The eastern boundary of the kingdom is formed by the Adriatic. Its limits to the north-east are fixed at the mouth of the river Ausa, west of the Isonzo. [FRIULI.]

The Lombardo-Venetian kingdom is governed by a Viceroy, who is generally an arch-duke of the Imperial Austrian family, and resides at Milan: it consists of two great administrative divisions: 1, Provincie Lombarde, or government of Milan; and 2, Provincie Venete, or government of Venice. These divisions acknowledge for their respective political heads the governors of Milan and Venice. Each division is subdivided into provinces called Delegazioni, at the head of which is a delegate; each province is divided into districts, and at the head of each district is a commissary. The districts are subdivided into communes, and each commune has a podestà for its local magistrate. The provinces are described under the following heads: Lombard provinces—BERGAMO; BRESCIA; COMO; CREMONA; LODI E CREMA; MANTOVA; MILANO; PAVIA; SONDRIO, or VALTELLINA. The Venetian provinces are likewise described under BELLUNO; PADOVA; ROVIGO; TREVISO; VENEZIA; VERONA; VICENZA; UDINE, or FRIULI.

The whole population of the kingdom consisted in 1832 of 4,279,000 persons, namely, 2,379,000 in the Lombard provinces, and 1,900,000 in the Venetian. (Serristori, *Saggio Statistico dell' Italia*, Vienna, 1833.) In 1837 the population of the Lombard provinces had increased to 2,460,079. (*Bollettino di Notizie Statistiche*, published by Lampato, Milano, Maggio, 1838.) We have not seen any corresponding statement concerning the Venetian provinces later than 1833.

The governor of each of the two great divisions of Milan and Venice is advised and assisted by a central congregation or provincial assembly, consisting of landholders and deputies from the royal towns, of which there are several in each province. Every province returns two landholders, one noble and the other not noble, as deputies, and every royal town returns one deputy. The respective communal or municipal councils select three persons, out of whom the emperor, as king of Lombardy, chooses one as a deputy. The deputies are elected for six years. These congregations are not legislative assemblies, but boards of administration; they settle the proportion of the taxes, both general and local; they inspect the accounts of repairs of roads, bridges, &c., and have also the superintendence of the charitable establishments of the country and their revenues. They can petition the sovereign concerning the wants and wishes of the people. Their resolutions are by a majority of votes. In every head town of a province there is a provincial congregation consisting of eight, six, or four landowners, one-half nobles, and the other half not noble, who concern themselves especially with the administration of the municipal and communal finances of their respective districts. The communes have their own councils, and a complete system of communal administration has been established. (*Collection de Constitutions, Chartes, et Loix fondamentales des Peuples de l'Europe et de l'Amérique*, par Dufay, Duvergier et Gaudet, vol. v.)

The administration of the Lombardo-Venetian kingdom since the Restoration has paid peculiar attention to the material improvements of roads, bridges, canals, dykes, and other public works, for which, in the course of fifteen years, from 1820 to 1834, the treasury has disbursed forty-two millions of livres for the Lombard provinces alone. This amount is independent of the sums expended by the communes for the communal or cross roads, which from 1814 to 1831 amounted to about twenty-four millions, for a length of 3294 miles of road. Thirty-five years since there were few communal roads in Lombardy deserving the name. Of the forty-two millions disbursed by the government treasury, five millions have been employed in constructing or repairing the dykes in the province of Mantua; about four millions in completing the great canal called Naviglio; a million and a half in making roads in the mountainous districts of Bergamo; about as much again for the great commercial road of the Splugen; two millions and a half for the road over the Stilfser Joch, and nearly three millions more for continuing it along the eastern bank of the lake of Como down to Lecco; 2,323,000 livres for completing the cathedral of Milan; another million for other improvements at Milan; 600,000 livres for the splendid bridge at Buffalora on the Ticino; 200,000 livres for a new asylum for the deaf and dumb; 270,000 livres for buildings accessory to the university of Pavia; 103,000 for a new college at Sondrio in the Valtellina; half a million for roads in the province of Pavia, &c. A recent French traveller observes that 'nowhere perhaps on the Continent is the administration of the roads and bridges more actively and usefully employed than in Lombardy. The whole of this part of Italy exhibits a solid material prosperity; it presents the fine side of the Austrian dominion. The roads are like the walks of a garden, and they are kept in repair with the greatest care. This government, economical and parsimonious in other respects, is great and magnificent in this. The excellent state of repair of the high roads of the Lombardo-Venetian kingdom is maintained at the annual expense of about 1,305,000 francs for 1518 Italian miles (60 to 1° of lat.) of length of road.' (Valéry, *Voyages en Italie*, b. 2, ch. xiv.)

The towns of Lombardy, Brescia, Bergamo, Como, and Milan above all, are being embellished, and are increasing in population. Venice is the only exception to this generally prosperous condition: but Venice had been silently decaying for a century before its fall; and Bonaparte, by subverting its national government, completed its ruin. The subsequent stagnation of maritime trade, during the long war that followed, aggravated her distress. When Venice came into possession of Austria in 1814, there were no less than 44,000 individuals, nearly one-half of the population, who required, if not permanent, at least occasional relief from charity. The hospices and other houses for the old, the infirm, &c., were in a state of decay, and from 1814 to 1821 nearly four millions and a half of livres were spent in restoring and supporting those institutions; and four millions more in the following ten years. By these means, about 6000 helpless individuals were relieved. The house of industry for the able-bodied poor had been neglected by French administration, and the commune or municipali

Venice was too poor to bear the extraordinary charges required in order to put that institution in a fit state to fulfil its object. The government took it in their own hands for some years, and spent 719,000 livres upon it, till the year 1821, when it was restored to the hands of the commune in a prosperous condition, being able to supply its expenditure by its own means and the produce of the labour of its inmates. Besides the classes thus relieved, there were still numerous families, many of whom had seen better days, but who had fallen into distress, and required at least occasional relief. For these a 'Commission of public beneficence' was established, consisting of the principal citizens, with the podestà and the patriarch at their head: the government began by contributing to its funds at the rate of 100,000 livres a year; it then received subscriptions, donations, and bequests, and now it has an income of about half a million of livres. It distributes relief, especially during winter and in seasons of dearth, to nearly 40,000 individuals annually. The payment of pensions to former public servants, and to several of the old patrician families (who lost their income by the fall of the republic), which had been interrupted under the French administration, was resumed by the Austrian government. Independent of these direct helps, the government undertook the repair of numerous palaces, churches, and other public buildings which were threatened with ruin, as well as of the canals and bridges, and especially of the great marble dyke called the Murazzi, upon which Venice depends for its safety from the waves of the Adriatic. Fifty-three millions of livres have been spent by the treasury for all these objects in the last twenty years. By making Venice the head town of one-half of the kingdom, and the seat of a government, and of numerous offices and boards of administration, considerable advantage has accrued to the town, inasmuch as salaries to the amount of nearly two millions of livres annually are expended in it. The archives of the Venetian republic, the richest collection perhaps of state documents existing, have been placed and arranged in the convent of the Frari, where they fill more than 200 apartments. The Ducal palace of St. Mark, with its splendid marble staircases and apartments adorned with paintings by Titian, Paul Veronese, Tintoretto, and other great masters, had been turned under the French administration into public offices and courts, to the great injury of its ornaments, paintings, and sculptures. The Austrian administration has cleared and restored that monument of antient Venetian greatness, and leaving it unencumbered for the admiration of the public, has purchased the palace Corner and other buildings, at the cost of nearly half a million of livres, for the accommodation of the offices and officers of the administration. Another half million has been devoted to the establishment of the Patriarchal Seminary, and an equal sum for the Academy of the Fine Arts. The whole of Venice has been made a porto franco, by force of which regulation articles of foreign importation are consumed within the town without paying duty. All these cares and benefits have considerably alleviated the general distress which was observable in Venice for several years after the peace: travellers who did not search into the remote causes of it, attributed all to the fault of the Austrian government. The accounts of those tourists who visited Italy in the first years after the peace, when everything was still unhinged in consequence of the great political change, are now quite out of date. The commerce of Venice has revived; the arrivals in the port of Venice, which were 1295 in 1832, amounted in 1837 to above 3000 vessels, of the aggregate burthen of 211,000 tons. Venice ranks now as the third port of Italy, next to Leghorn and Genoa. The maritime commerce of Austria has increased wonderfully since the peace. Twenty years ago it had not above 300 merchant vessels; it has now above 3000, about one half of which belong to Venice. (*Bollettino Statistico di Milano* for the years 1835-38; *Semplice Verità in risposta alle Accuse di Enrico Misley*, Paris, 1834.)

In the department of popular education the Austrian government has extended to the Lombardo-Venetian kingdom the same general and uniform system which it had already established in its German States, and which is one of the most complete in all Europe. The elementary schools were first opened in Lombardy in 1822, and ten years after there was hardly a commune without its school, whilst several of the more extensive and populous communes had two. The number of communes in the Lombard provinces is 2234, and the elementary schools for boys are 2348, and those for girls 1231. Out of the aggregate number of the schools there are 71 upper schools consisting of four classes; the rest consist of two or three classes. The course of instruction is:—First class, spelling, slate-writing, elementary religious instruction, the first two rules of arithmetic. Second class, reading, writing, the catechism, the four rules of arithmetic, and fractions. The course in the first and second classes lasts three years. Third class, calligraphy, Italian grammar, specimens of epistolary and narrative composition, the elements of Latin, explanation of the gospels for Sundays and other holidays, arithmetic, fractions and rule of three. Fourth class, geometry, the principles of architecture, mechanics, geography, drawing, natural history. A fifth class is established in the chief towns of provinces, in which are taught history, the principles of commerce, book-keeping, mathematics, chemistry, the history of the arts, and the German, French, and English languages. The course in the upper schools lasts from three to four years.

The female elementary schools are divided into three classes:—First class, spelling and writing, mental arithmetic, needlework, written arithmetic, and religious instruction, consisting of the little catechism. Second class, religious instruction, orthoepy, the elements of grammar, the four rules of arithmetic, writing and parsing, marking and embroidery. Third class, sacred history, explanation of the gospels, calligraphy, Italian grammar, epistolary composition, the knowledge of weights and measures, and of currency.

In these schools there is upon an average one teacher for every 40 pupils. Corporal punishment is strictly forbidden. The tuition is gratuitous, the schools being supported from the communal fund. The schoolmasters have from 250 to 400 livres of fixed annual salary. A register is kept in every commune, and verified by the rector of the parish, of all the children from 6 to 12 years of age, who are all expected to attend their regular course at the schools, unless they have a dispensation from the visiting inspector, on account of illness or other sufficient cause.

In 1833 there were in the province of Bergamo 906 boys out of every 1000 of the prescribed age who attended the elementary schools. In the province of Como there were 778 out of every 1000; in that of Brescia 747; in that of Sondrio or Valtellina 733; in that of Milan 687; in that of Pavia 647; in Lodi e Crema 646; in that of Cremona 632; in that of Mantua 513. The proportion of girls was as follows:—Bergamo 909 of every 1000; Brescia 619; Sondrio 427; Pavia 403; Lodi e Crema 382; Mantua 330; Milan 302; Cremona 210; Como 195.

Of the Venetian provinces we have not seen later reports than 1825, when the system had not had time to attain its full extent. There were then about 1400 schools, attended by 62,000 boys, being only one-fourth of the whole number of the prescribed age, and directed by 1553 teachers or assistants, and 29 female schools frequented by 2390 girls. There were 405 communes still deficient in schools. The system however was extending, and has been in progress annually ever since. (Quadri, *Prospetto Statistico delle Provincie Venete.*)

The text-books used in these schools are: spelling-book for the lowest class, spelling-book and reading-book; little catechism; an historical compendium of the Old Testament; historical compendium of the New Testament; duties of subjects; elements of physics; elements of geometry; introduction to geography, in two parts; introduction to Italian grammar; guide to composition; religious instruction for the two elementary classes; methodical guide for teaching; little tales for instruction; principles of arithmetic in four parts, for each of the four classes. These books are sold at a few centimes each, and about 192,000 copies of them are distributed annually to the pupils. (Sacchi, *Memoria Statistica sull' attuale Stato dell' Elementare Istruzione in Lombardia, in confronto degli altri Stati d'Italia*, Milano, 1834; *Bollettino Statistico di Milano, anno* 1835, *primo semestre*, pp. 81, and fol.)

In the upper elementary schools of the chief towns of provinces there are courses of methodical teaching for those who are intended for schoolmasters. About 500 pupils follow these courses annually.

There are also in the towns and villages of Lombardy 'scuole festive,' or Sunday and holiday schools, above 200 in number, for children above twelve years of age, or for those below that age, who cannot on account of their occupations attend the daily elementary schools. In some of these lessons are given in drawing applied to the arts. In Milan the Academy of the Fine Arts gives evening courses during the winter for those operatives who wish to learn ornamental, architectural, and plan drawing, machinery, engineering, &c. There are also for the wealthier classes about 50 collegi convitti, or public boarding-schools, and 80 private ones, besides 600 private daily-schools. Infant-schools have also been established of late years in most towns of Lombardy. ('On the Institution of Infant Schools and Holiday Schools in Lombardy,' in No. xix. of the *Quarterly Journal of Education*, July, 1835.)

From the upper elementary schools boys who intend to pursue their studies pass into the gymnasia, of which there is one in almost every town, and about 66 in the whole kingdom, with about 300 professors, and attended by between 7000 and 8000 students. The gymnasial course lasts six years, four of which are employed in the study of Latin and Greek grammar and prosody, the geography and history of the Austrian empire, and Roman antiquities. The other two years are engrossed by rhetoric and poetry, study of the classics, algebra, general geography, and history, antient and modern, and religious instruction. (Sacchi, *Quadro Statistico dell' Istruzione Ginnasiale in Lombardia*, in the *Bollettino Statistico di Milano*, March, 1835; and also an article on 'Italian Education,' in No. vi. of the *Quarterly Journal of Education*, April, 1832.) Besides the gymnasia, there are 38 private institutions for youths, 'case private d'educazione maschile,' approved of by the government, which exercises an inspection over them. There are two general direzioni, or boards, at Milan and Venice, for the superintendence of all the establishments for secondary or grammar education throughout the kingdom. For the instruction of young ladies there are 34 collegi femminili, mostly under the direction of the nuns of Santa Teresa, of Sales, of Santa Chiara, and other orders, which devote themselves to the education of youth, and which are the only convents existing in the Lombardo-Venetian kingdom. All other monastic institutions were suppressed long since under the French, and their property was sold.

The Lombardo-Venetian kingdom is not only better supplied with elementary instruction than any other Italian state, but it is the only one in which a universal system of popular education has been established. With regard to 'secondary' or gymnasial education this kingdom is also better provided than any other Italian state, the continental dominions of the king of Sardinia alone excepted. The method however of the gymnasial education has remained as it was of old, and is susceptible of improvement. It is considered by many persons that too much time is spent about Latin, at least by the majority of the pupils, who are not intended for the bar and other learned professions. Above the gymnasia are the Lycea, of which there are 12 in the whole Lombardo-Venetian kingdom, namely, two at Milan, and one in each of the following towns: Bergamo, Brescia, Mantua, Cremona, Como, Lodi, Venice, Verona, Vicenza, and Udine. The Lycea are devoted to philosophical studies, and the course lasts two years.

Lastly, the two universities of the kingdom, Padua and Pavia, supply instruction in all professional branches of learning. A detailed account of these universities is given in an article on the 'Statistics of Education in Italy,' in Nos. v. and xvi. of the *Quarterly Journal of Education*, Oct. 1834.

The object of the Austrian government in this extensive system of education is clear and definite; it proposes to form a population of docile but not ignorant or indolent subjects; to make individuals in general contented with their respective stations in life, without precluding any one from using his honest exertions to make the best of that station; and also, if talents and opportunities should favour, to rise to a higher one without injury to others or disturbance to society. There is no exclusive caste in Lombardy; all are equal before the law, and any one may attain the highest offices of the state. 'The Austrian government,' says an intelligent French traveller, already quoted, 'is both military and pedagogical; sergeants and schoolmasters are its functionaries. The effects of this general education are already quite perceivable in Lombardy, and we may expect soon to see the fulfilment of a very fine sentiment of the emperor Francis. Being urged once by some Milanese noblemen to proclaim a distinct criminal statute for this kingdom, as the Austrian statute was considered too mild for the temper of the Italians, he refused, saying that the spread of education and civilization would render his code as fit for Lombardy as it was for the hereditary states. "When all the people shall be able to read," said he, "they will stab no longer."' (Valéry, *Voyages Historiques et Littéraires en Italie*, b. iii., ch. 12.)

The Austrian civil and criminal codes are in force in the Lombardo-Venetian kingdom. Of the merits of the Austrian civil code much has been written, and several modern jurists, Thibaut, Schmidt, and others, have considered it in several respects superior to the French or Napoleon code. The penal code is generally milder than the French; but the trial, or *débats*, as the French call them, are not public: the depositions of the witnesses are taken in writing, and communicated to the accused, who can demand to be confronted with the witnesses against him. A legal proof is required, besides the full moral conviction of the judge, in order to condemn a culprit. This legal proof is made out not solely, as it has been misstated, from the confession of the accused, but also from the deposition of the witnesses and from circumstantial evidence. Two assessors attend the judge throughout the whole proceedings, and affirm upon oath their legality and impartiality. Every species of torture has been abolished since the reign of Joseph II. The Austrian penal code has also abolished the penalty of confiscation, which the code Napoleon retained in certain cases—among others, against emigrants. By the Austrian law, the property of a state prisoner or political emigrant who will not surrender himself for trial is placed in the hands of trustees, who administer it for the benefit of his family, creditors, and heirs; and it is restored to him on his return, or to his next of kin after his death, if he dies an emigrant. For other particulars we refer readers to the code itself, as many misrepresentations of its provisions have gone about the world, in books of travels or political pamphlets, few of the authors of which have taken the trouble of ascertaining the truth. There is however one work, with a half-official character, which has undertaken to refute many of the most outrageous charges made against the Austrian administration in Lombardy, by appealing to texts, dates, and notorious facts. (*Semplice Verità in risposta alle Accuse di Enrico Misley*, Paris, 1834.)

Religious toleration is guaranteed by the Austrian laws. The Protestants have a chapel at Venice, and another at Bergamo. The Greek or Eastern communion has a church at Venice; and the Jews have synagogues at Venice, Mantua, Padua, and other towns.

The Italian regiments are,—eight of infantry, of three battalions each; one battalion of chasseurs, or light infantry; and one regiment of cavalry. These are numbered among the other regiments of the Austrian army, and, like them, are called to do duty in any part of the monarchy. There are besides two garrison battalions at Mantua and Venice; and a corps of gendarmerie for the police service. There is a military college and a school of artillery at Milan. The navy consists of from thirty to forty vessels of war, including three ships of the line; and its principal station is at Venice, where there is a college for cadets, also a corps of marines, and a battalion of naval artillery. In all, the number of the military furnished by the kingdom in time of peace amounts to about 30,000 men, being one man to 142 inhabitants. [AUSTRIA, EMPIRE OF.] There are eight fortresses in the kingdom, namely, Mantua, which is the strongest of all, Peschiera, Legnago, Osopo, Pizzighettone, Rocca d'Anfo, Palmanova, and Venice. The Austrian troops garrison also, conformably to treaties, three frontier places belonging to neighbouring states, namely, Piacenza in the Duchy of Parma, and Ferrara and Comacchio in the Papal State. In most head towns of provinces there is a commandant. The 'comando generale militare,' or military head-quarters, is stationed at Verona.

The hierarchy consists of two archbishops, of Milan and Venice, the latter of whom has the rank of Patriarch; and eighteen bishops. The parishes are 4483, and the clerical seminaries 17. The clergy in all amount to 23,818 individuals.

The judiciary consists of a Tribunale di Prima Istanza, both for civil and criminal matters, in every head town of a province; of two courts of appeal, one at Milan and the other at Venice; and lastly, of a supreme court for the whole kingdom, called the Senate, which sits at Verona. Two commercial courts are established, one at Milan and the other at Venice. In each of the smaller towns is a Pretore, or inferior judge, corresponding to the juges de paix in France. There are 133 Pretori in the whole kingdo

The Lombardo-Venetian kingdom is generally one of most fertile countries of Europe; and the industry of the inhabitants and the extensive system of irrigation increase the natural fertility of the soil.

The numerous rivers which come from the Alps are perennial, and the fields of Lombardy never appear in that parched condition which those of southern Italy, and of many parts of Spain and Portugal, exhibit in summer. The most fertile provinces of the kingdom are those of Lombardy proper, and those of Padua, Treviso, Vicenza, Verona, and Friuli, in the Venetian territory. The poorest provinces are Valtellina and Belluno.

Lombardy proper produces in abundance every thing that is necessary for the sustenance of its population; corn, wine, rice, fruits, cheese, and excellent meat. The two principal articles of exportation are:—1, silk, which is exported annually to the amount of eighty millions of Italian livres, or about 3,200,000 pounds sterling, besides silk manufactures of the value of from twelve to fifteen million of livres: 2, rice, of which the average annual produce is valued at about thirty millions of livres, one half of which is exported. The districts in which the rice is cultivated are the low flats of the provinces of Mantua, Crema, Cremona, and part of that of Milan, as well as the provinces of Padua and Rovigo. The cultivation of rice, which requires the fields to be laid permanently under water for a certain period, has been considered by many as productive of diseases among the peasantry, and yet other authorities, persons who are natives of the districts, and medical men also, among others Frank and Adolfi, contend that this is an error, and that the inhabitants of the rice districts, such as Crema, enjoy as much health and as great longevity as those of the hilly countries of Bergamo and Brescia. (*Analisi delle Risaje*, Crema, 1833; and also an article, 'Le Risaje del territorio Cremano giustificate,' in the *Bollettino Statistico* of Milan, June, 1838.) The other articles of exportation are cheese, especially from Lodi, which is erroneously called Parmigiano, and hemp, which is cultivated in the provinces of Padua, Venice, and Rovigo. Salt is imported from Istria, Parma, and Sicily.

The principal manufactures, besides those of silks already mentioned, are glass, especially at Venice, paper, ornamental works in bronze, and straw hats, especially at Bassano, which are equal to those of Tuscany: there are also establishments for spinning cotton, and other minor works. Lombardy is essentially an agricultural country, and receives most of the manufactured goods which it uses from the other parts of the Austrian monarchy. The bookselling and publishing trade, although subject to the censorship, is more flourishing at Milan than in all the rest of Italy put together. About 1000 new works of every description are published annually throughout the kingdom. Expensive engravings, as well as lithographic prints, form a considerable branch of industry. The journals published in the Lombardo-Venetian kingdom amount to nearly forty; there are daily newspapers at Milan and Venice, and weekly ones in most of the head towns of provinces, and the rest are scientific and literary journals, either monthly or quarterly. Milan and Venice have each an academy of the fine arts, and Milan has also a 'conservatorio,' or college for musical pupils.

The public charitable establishments, hospitals, orphan and foundling asylums, houses of industry, Monti di Pietà, &c., in the whole kingdom are to the number of eighty-eight.

The taxes paid by the kingdom amount to about eighty-three millions of livres, or nearly three millions and a half sterling, and the sources of taxation have remained for the most part the same as they were under the French administration, but the respective burthens of some of the taxes, such as the land-tax, the tax derived from the monopoly of salt and tobacco, the postages, &c., have been somewhat alleviated since the Austrian restoration. The latter has abolished the tax which the French government had put on those who exercised the liberal professions, such as artists, literary men, physicians, &c.

With regard to the expenditure, the public officers, and especially the magistrates and judges, are better paid now than they were under Napoleon's government. In the Lombard provinces alone, the stipends of the judges and pretori amount to 2,055,070 livres or francs annually, while under Napoleon they amounted to 1,640,389 livres only. The professors of the universities of Pavia and Padua have also had their salaries increased. We have already seen that the government treasury assists the communes in supporting and extending the system of popular education. The large sums spent annually by the treasury on public works, roads, canals, dykes, bridges, and charitable institutions have also been mentioned above. The conservatory, or school of music, at Milan, under the French was supported by the tax laid on the licensed gambling-houses annexed to the theatres. The Austrian government has suppressed the gambling-houses, and pays out of its treasury 36,000 francs for the conservatorio, and 240,000 as an encouragement to the theatres.

Making every allowance for the political aspirations and disappointed national feelings of many Italians who regret being dependent on a foreign power, it may be affirmed with safety that the Lombardo-Venetian kingdom is in a thriving and progressive condition, and that it is the best administered country in Italy, excepting perhaps Tuscany.

The general amnesty published in September, 1838, by the emperor Ferdinand, in favour of all political offenders, has contributed to restore a feeling of satisfaction to the bosom of numerous families. Further investigation and discussion on the subject of the Austrian administration in Lombardy may be found in two articles of the *Foreign Quarterly Review*, 'The Austrian Government and the Italian Liberals,' in No. xxvi., May, 1834; and 'Italy and Europe,' in No. xxviii., December of the same year.

LOMBARDY and LOMBARD CITIES. The name of Lombardy, which is derived from that of the Longobards, its former possessors, has been applied in its widest sense, though with no very definite limitation, to that tract of country which the Romans called by the name of Cisalpine Gaul, and which includes the principal part of the basin of the Po, from the point where that river leaves behind it the hills of Montferrat to its entrance into the Adriatic. It consists chiefly of an immense plain nearly two hundred miles in length, and from between sixty to seventy miles in breadth from the lower offsets of the Alps to the foot of the Tuscan Apennines, besides the numerous valleys which open into it from the north. A physical description of this fine region is given under Po.

The overthrow of the kingdom of the Longobards by Charlemagne did not destroy the political existence of that people. They retained their laws and institutions, their property, and their numerous and powerful nobility; they continued a nation and a kingdom, subject however to the monarchy of the Franks. At Pavia, which was then the capital of the country, the successors of Charlemagne were crowned with the iron crown of Lombardy as kings of Italy, previous to their coronation at Rome as emperors of the West and kings of the Romans. The Longobard code continued in force for the Longobard population, while the descendants of the antient inhabitants, or Romans, as they were called, lived under the Roman law. The name of Lombardy was retained, but only for a part of the former dominions of the Longobards: the duchies of Spoleto, Friuli, Tuscany, and Benevento, although some of them continued to be ruled by Longobard dynasties, were not included in the general name.

The feudal system, according to which the possession of land was the pay of the soldier, and constituted his liability to military service and feudal duties, was more fully developed under the weak successors of Charlemagne, when every duke, count, or marquis began to consider himself as independent, and in order to support his independence divided and subdivided the land belonging to him among numerous subfeudatories called vavassors, who swore fealty and homage to him, and were bound to follow him to the wars.

At the same time, that is to say, about the ninth century, the towns began to rebuild their walls, which had been razed by the barbarians, in order to defend themselves against the incursions of the Hungarians, Saracens, and other predatory bands. The towns had retained the antient system of curiæ, or municipalities, and the citizens elected their own magistrates. The distinction between Longobard and Roman became gradually obliterated among the people; they were all Italians or Lombards together.

After the deposition of Charles the Fat in 888, the crown of Italy was disputed for about seventy years among a succession of pretenders, Italians and Burgundians, until Otho I. of Saxony seized it with a firm hand, and was crowned at Rome by the pope, A.D. 961. Otho and his successors resided chiefly in Germany; they came now and then to Italy at the head of armies, when they generally pitched their tents and held their sovereign court in the plain of Roncaglia near Piacenza, whither all the great feudatories of Lombardy and other parts of Italy, and the magistrates of the towns, were summoned to pay their homage, and to listen to the sovereign's decisions and 'placita.' But with the emperor's return to Germany the great vassals retired to their castles, and the magistrates and bishops returned to their cities. Each town and district was in a manner independent of every other, all acknowledging allegiance to a distant sovereign.

The political system of most towns of North Italy in the tenth and eleventh centuries consisted of the nobles, feudatories, and subfeudatories, at the head of whom were the respective archbishops or bishops, and of the principal citizens, who constituted their council, and were consulted by them. The citizens elected their magistrates, called *scabini*, subject to the approval of the bishop. The emperors appointed to the sees, the old mode of election by the clergy and people having fallen into disuse in consequence of the bishops having become feudatories of the empire. The emperors also appointed from time to time their missi, or commissioners, who were often Italian nobles or prelates, and were the representatives of the imperial authority. As for the supposed municipal charters granted to the towns by Otho I., there is no evidence of them. A veil covers the first period of the history of the municipal emancipation of the towns of Lombardy, for no historian of the tenth or eleventh century has traced its progress; it grew silently under the reign of Otho and his successors, the citizens slowly and gradually appropriating to themselves the prerogatives of the sovereign, and not wishing to attract attention to their encroachments.

Towards the middle of the eleventh century we find discord first breaking out in Milan and other cities between the various classes of the population. The vavassori, or inferior nobles, of whom there were several gradations, owing to the extensive system of subfeudation, or subtenure, rose in arms against the great nobles, at the head of whom was the archbishop Heribert. The archbishop defeated them and drove them out of Milan, but being joined by the malecontents from the neighbouring towns, they appealed to the emperor Conrad, who came to Italy in 1036, and deposed and imprisoned the archbishop. Heribert soon made his escape, and returned to Milan, where he was joyfully received by the clergy, the nobles, and the people, and in order to defend himself against the imperial forces he called to arms the people of every district of the town, without distinction of condition. Till this time the use of arms had been a privilege of the nobles or milites. On this occasion Heribert introduced the carroccio, or cart drawn by oxen, in imitation of the ark of the Israelites, with the great banner of the city fixed upon it, which was drawn in the midst of the militia, and upon which stood the leaders, who from a raised platform gave their directions during the fight. By degrees every city adopted the carroccio, which became a kind of palladium, and the emblem of popular independence. Thus it was that the episcopal government of Milan and other cities prepared the way for their municipal liberty. In 1041 the plebeians or burghers rose against the whole class of nobles, owing to some insult offered by one of them to a common citizen. Lanzo, himself a noble, led the people; a battle was fought in the streets, and the nobles were obliged to leave with their families. The archbishop Heribert, who this time had taken no part in the quarrel, emigrated with the rest. The nobles, being joined by others, blockaded Milan, and reduced the citizens to famine, when after three years Lanzo managed to bring about a reconciliation, and the nobles returned. In fact, the citizens could not well do without them, for they formed the only cavalry; and their acquaintaince with the world and their connexions with other states made them useful in the councils.

In 1059 began the long struggle at Milan and in the rest of Lombardy on account of the married clergy. The church of Milan had its peculiar liturgy and system of discipline, called Ambrosian from its great bishop St. Ambrose, and was almost wholly independent of Rome. According to this discipline married men could be ordained priests, as in the Eastern church, and could continue to live with their wives, though an unmarried priest could not marry after his ordination. If a priest became a widower and married again, he was interdicted from exercising his functions. Several passages in the works of St. Ambrose seemed to countenance this system, which existed for ages in other parts of the Western church, notwithstanding several councils had attempted to enforce celibacy among the clergy. At last the council of Pavia, A.D. 1021, in which pope Benedict VIII. presided, attended by the archbishop Heribert, decreed that married priests should separate from their wives and observe in future perpetual celibacy. But the archbishop did not strictly enforce this decree in his diocese, and things continued as before till long after his death (Giulini, *Storia di Milano*, vol. iii.), when several fanatics, among whom was a deacon, excited the people against the married clergy, and against the archbishop Guido, who favoured them; and great disorders followed. Hildebrand, afterwards Gregory VII., who directed the councils of Rome at the time, took part with the zealots, with the view of subjecting the see of Milan entirely to that of Rome. Pope Alexander II. undertook to enforce the decree of celibacy, and he sent for the purpose Erlembaldo as his legate to Milan, giving him a consecrated standard, and issued at the same time a brief forbidding any one to hear the mass of a married priest. This was in the year 1063, and it revived the tumults in Milan. Erlembaldo, supported by a troop of factious persons, insulted the clergy and even drove them from the altar. Then came a bull of excommunication from Rome against the city of Milan, because its clergy and people would not submit to the papal orders. The archbishop however stood firm on the rights of his see, and the people, taking his part, drove away the zealots and the agents of Rome. Weary of the struggle, the archbishop at last resigned, and Gotofredus, a Milanese cardinal, was elected in his stead and consecrated by the suffragans. Pope Alexander excommunicated him, and appointed a certain Attus in his place. Civil war now raged at Milan for several years, until Erlembaldo, the great leader of the zealots, was killed in an affray in the year 1076, to the great joy of the citizens. Gregory VII., for he had now become pope, seeing that force could not subdue Milan, began to weaken its metropolitan by detaching the suffragans from his jurisdiction, annexing Como to the patriarchate of Aquileia, Aosta to the archbishopric of Tarantasia, and Coira to that of Mainz. Genoa and Bobbio were detached from the jurisdiction of Milan at a later period. The great influence which Gregory acquired through the aid of the Countess Matilda, and his triumph over the emperor Henry IV., facilitated the subjection of the see of Milan, whose archbishops became gradually dependent on Rome, received the pallium from the pope, and swore obedience to him. As a consequence of this the clergy became subjected to the Roman discipline, and the regulation was enforced of not admitting any persons to orders except unmarried men. Nothing is said by the historians about those who were already married, but it appears that they were allowed to live and die in peace. Verri, in his *Storia di Milano*, ch. v., has carefully investigated this curious and obscure period of ecclesiastical history, which saw the extinction of the independence of the Milanese or Ambrosian church.

In the great contest of the investitures, Milan, Lodi, Cremona, and other Lombard cities were at first swayed by the nobility, who were mostly favourable to the emperor, but at last in the decline of the imperial authority they joined the Countess Matilda and her second husband Guelph, with whom they formed an alliance. It was during this long struggle that the cities really established their independence, acknowledging no longer the imperial missi, or vicars. The citizens then began to elect a certain number of magistrates, whom they styled consuls, who administered justice and commanded the militia; they were chosen from three orders, namely, captains, or nobles of the first rank, vavassori, and burghers. How the consuls were elected, how many there were, and how long they remained in office, is not ascertained; for the chroniclers of those times do not enter into these particulars. We find as many as twenty consuls at the same time mentioned. The rural nobles inscribed themselves among the citizens, and came to reside, at least for part of the year, in the city, in order that they might participate in the political rights. A council of credenza, 'trust,' consisting of a certain number of citizens of each class, formed a town-council, which deliberated in secret. On important occasions the parliament, or general comitia of the people, was convoked by the sound of the great bell, to give their opinion by acclamation on some matter which had already passed the council of trust. The decisions were promulgated in the name of the 'popolo,' or 'commune,' which meant the whole community. There was no distinction between the judicial and executive powers any real legislature; and for this reason, that the right of making laws was still considered as a prerogative of the king or emperor, assisted by the magnates, or great feudatories, and by the judges, at the great diets convoked for the purpose in the plain of Roncaglia. Laws and written constitutions were few in those times, and the consuls enforced the customs and precedents, 'consuetudines et usus,' which were collected, in 1216, in a kind of code, and published at Milan and other cities. The war of the investitures being over, the cities continued to acknowledge, at least nominally, the emperor's sovereignty over Italy, his right of exacting military service, of giving the investitures of feudal tenures, of sending royal and imperial judges distinct from the magistrates of the people, of demanding the 'foderum,' or tribute for the maintenance of the emperor and his suite whenever he came to Italy, and lastly of sending from time to time his 'missi,' or vicars, who represented the person of the sovereign.

The Lombard cities, having now secured their municipal liberties, began to fight among themselves. Milan and Pavia were rivals of old, and Cremona, which was the third great city of Lombardy, was also jealous of Milan. But before they turned their arms against one another, they began by attacking their weaker neighbours. Cremona attacked Crema, Pavia attacked Tortona, and Milan attacked Lodi and Novara. At last Lombardy became divided between two parties: that of which Milan was the head included Brescia, Crema, and Tortona; and the other consisted of Pavia and Cremona, Lodi and Como. It was not ambition alone that led them to fight; it was an exuberance of animal courage, the pride of physical strength, which led one city to send challenges to another to fight on a certain day and place, to decide which of the two people was the most valiant. 'We cannot,' says Mr. Hallam, in his 'Europe during the Middle Ages,' 'extend our sympathy for the free institutions of the Italian cities to the national conduct of those little republics. Their love of freedom was alloyed by that restless spirit, from which a democracy is seldom exempt, of tyrannizing over weaker neighbours. They played over again the tragedy of antient Greece, with all its circumstances of inveterate hatred, unjust ambition, and atrocious retaliation, though with less consummate actors upon the scene.'

The people of Milan had been engaged in frequent disputes with those of Lodi, as early as the time of the archbishop Heribert, who had forced on Lodi by his arms a bishop of his own choice. From this time a mutual rancour continued to exist between the two cities, which lasted for nearly a century. In 1107 the Milanese made war upon the people of Lodi, destroyed their harvests for four consecutive years, and at last, in June, 1111, took the town, killed many of the inhabitants, plundered the rest, razed their houses, and drove the survivors to the neighbouring villages. The spot is still known by the name of Lodi Vecchio. The people of Pavia on their side took Tortona and burnt it. In 1118 the Milanese began a furious war against Como, which lasted ten years, and which an anonymous contemporary poet has compared with the Trojan war. In 1127 the people of Como were obliged to submit to pay tribute to Milan, and the walls of their town were razed. The distant emperors, whose authority since the war of the investitures had become almost null, did not attempt to check these disorders. But in the year 1152 Frederic of Hohenstauffen, a man of a different stamp from his predecessors, was chosen emperor by the electors of Germany, and in 1154 he crossed the Alps, assumed the iron crown of Italy at Pavia, and afterwards the imperial crown at Rome. He was beset on his way by Italian exiles, especially from Lodi, who complained of the tyranny of Milan and the other dominant cities.

Frederic spoke to the Milanese the language of reason and justice; he ordered them to let their neighbours of Lodi live in peace, and allow them to rebuild their town. The Milanese with scorn refused to obey, and the war began between the emperor, joined by the militia of Pavia and Cremona on one side, and the Milanese and their allies on the other. The war lasted several years, and horrid cruelties were committed by both parties. At last Milan was obliged to surrender, in March, 1162; the inhabitants were ordered to leave the town with all they could carry, after which Milan was sentenced to be treated as it had treated Lodi—to be razed to the ground; and the people of Cremona, Pavia, Lodi, and Como readily executed the sentence. The Milanese were scattered in the villages around. Thus far the treatment of Milan was only a stern retribution; but a change took place in the character of the respective parties; the conquerors abused their triumph, and the former oppressors became the oppressed without having given any fresh provocation. Frederic having returned to Germany, his officers and podestas treated the Milanese and other Lombards with the most unsparing rigour, and oppressed them in every way. Even the towns of the Imperial party, such as Cremona, were not treated much better; they were allowed to retain their consuls, but were oppressed with taxes. The emperor was applied to for redress, but in vain. At last a general spirit pervaded the cities of Lombardy, and extended to those of the Marches of Verona and Treviso beyond the Adige. In April, 1167, a secret conference was held by deputies of the various cities, in the convent of Pontida, in the territory of Bergamo; and it was resolved to form a league for the common protection, and to assist the Milanese in rebuilding their city. Pope Alexander III. declared himself protector of the Lombard league, which consisted of fifteen cities: Cremona, Bergamo, Brescia, Ferrara, Bologna, Modena, Milan, Parma, Piacenza, Verona, Vicenza, Padua, Venice, Treviso, and Lodi, which was obliged to follow the rest. The league was afterwards joined by Ravenna, Rimini, Reggio, Bobbio, Tortona, Vercelli, Mantua, and Novara. Pavia only remained attached to the emperor's party, and as the marquis of Montferrat took the same side, the allies, after rebuilding Milan, founded a new town on the borders of Montferrat, which they called Alessandria, from the name of their protector. The towns re-established their consular governments, and a kind of federal diet was assembled at Modena, composed of consuls of the various cities, who were styled rectors of the league. But this appearance of a federal union lasted only as long as the contest with Frederic, after which it dissolved itself. The league however carried its purpose bravely for the time. After several campaigns, the Lombard militias completely defeated the Imperial army at Legnano, in May, 1176, took the emperor's camp, and Frederic was obliged to escape alone to Pavia. This led to a truce, and afterwards to the peace of Constance, in 1183. By this celebrated treaty, which served for ages after as an authority for regulating questions which arose between the German empire and the North Italian states, the cities were confirmed in their independent administration; they had the right of declaring war, of coining, in short all the attributes of sovereignty, under an acknowledgment however of the emperor as king of Italy and their suzerain, who appointed an imperial vicar to represent him in Lombardy, as well as judges of appeal in civil matters; and they were bound to furnish him with foderum on his passage, as well as with a military contingent against other states who were not members of the Lombard league.

The glorious struggle of the Lombards for their independence being terminated, they soon fell again to quarrelling among themselves. Several of the towns, in order to check their internal factions, adopted the institution of the Podesta, which Frederic had first introduced. This officer was a kind of dictator; he was supreme judge, assisted however by lawyers or assessors, and had the right of inflicting capital punishment. He was always chosen from the territory of another town, and from among the nobility, and changed generally every year. It was imagined that by chosing a stranger, impartiality might be better secured. Milan chose, in 1186, for its podesta, Uberto Visconti, of Piacenza. The consuls still remained as magistrates of various kinds. The first in rank were styled 'Consuls of the Commune,' and they commanded the militia of the respective districts of the city. There were also 'Consuls of Justice,' who were justices of the peace, and 'Consuls of the Merchants,' elected by the various trades. The consuls of the commune had the administration of the finances, but were obliged to consult with the council of credenza. In 1198 a fresh rupture broke out at Milan between the nobles and the 'popolani' or burghers. The latter insisted on having their separate council, which was called 'Credenza di Sant' Ambrogio,' and it happened that several nobles sided with the popular party, and had their names inscribed in the registers of trades. The Credenza di Sant' Ambrogio was at first composed of artisans; the wealthier citizens, merchants, and men of liberal professions formed another distinct credenza, which they called Della Motta. The valvassori, or inferior nobles, formed likewise their own council (Verri says they joined that of La Motta) distinct from that of the higher nobles or capitani, who, with the archbishop at their head, assembled in their own council, called 'Credenza dei Gagliardi.' Each of these councils had its consuls, who made edicts for those under their respective jurisdiction. In matters concerning the whole state, deputies from each class assembled in a general council, the numbers of which appear to have varied from 200 to 1000. The manner of electing these deputies, their condition and qualifications, and the duration of their office, are not ascertained. The podestà summoned the general council upon important occasions.

The four credenze however generally resolved themselves into two parties, the nobles and the popolani (or plebeians). The nobles of that epoch were strong by their connexions, their subfeudatories and dependents, forming altogether a numerous and compact body, the most warlike part of the population; they were the only cavalry that had stood the brunt of the wars against Frederic Barbarossa. Their superior address, their acquaintance with foreign courts and councils, gave them great advantage; the archbishop and his dependents were on their side; and so in most cases was the podestà, as he also was a noble. But they were haughty and overbearing towards others, and quarrelsome among themselves; and the burghers on their part, as they became wealthier, would no longer brook their assumed superiority. The consequence was that the nobles were driven out of Milan and Brescia, but they returned, being supported by their friends from Cremona and other places. Reggio, Bologna, and other cities were likewise distracted. Besides these internal feuds, there was the old rivalry among the towns, which revived after their united contests with the emperor had terminated. The interminable list of these petty wars, which is given by Bossi and other historians, without any intelligible account of the origin of most of them, excites a feeling of indignation mixed with contempt; people were killed, property was destroyed, and families were made unhappy by these absurd feuds.

One half of the index of the fifteenth volume of Bossi's 'History of Italy,' which comprises the events of the thirteenth century, consists of such heads as these:—Wars of the Lombard cities; private wars of various Italian cities; other wars of the Italian cities; fresh contests between the Italian cities; peace made between several cities; wars and tumults in the cities; wars of the Italian cities (this head is repeated at least twenty times); wars of Lombardy; tumults of Brescia and Milan; tumults at Piacenza; wars in Lombardy and other parts of Italy; wars of Romagna, Genoa, Tuscany, &c.; and all this, independent of the great struggle which was then carried on between the popes and Frederic II. and his son Manfred. [GUELPHS AND GUIBELINS.]

Such was the condition of the free Italian cities in the thirteenth century, and such the manner in which their citizens enjoyed that independence for which their fathers had bravely fought at Legnano. The eloquent panegyrist of the Italian republics of the middle ages attempts to excuse their pugnacious propensity by observing that 'there were then no regular soldiers like ours, who have now to bear all the privations and dangers of war; military service was then a temporary duty, the pleasure and pastime of every citizen, to which he consecrated a few days every year; he fought in sight of his own walls; if he was wounded he was brought back to his own house; and if he died his loss was lamented by all his townsmen' (Sismondi, *Républiques Italiennes*, ch. xv.); and further on he says that 'in all the quarrels of the wealthier citizens, first with the nobles, and afterwards with the lower classes, civil liberty was frequently violated, and personal rights and security were often overlooked; but while in the midst of these disorders civil liberty was trampled upon, democratic liberty remained. Democratic liberty consists, not in security, but in power; it does not ensure to nations either tranquillity or order, economy or prudence, but it carries within itself its own reward. It affords the sweetest enjoyment to the citizen who has once tasted of it, in the gratification of influencing the fate of his country, and of sharing in its sovereignty, not acknowledging any authorities he has not himself created.' (*Républ. Ital.*, ch. xxv.) This is a portrait of democracy by one of its ablest and most conscientious apologists.

It has been said that notwithstanding all these feuds the Italian free cities prospered; the real truth is that some of them flourished at the expense of the others. It is observed that a number of towns which are mentioned as being of importance in the eleventh century, had disappeared in the thirteenth. We read of the glory and wealth of Milan and Florence, but we take no account of the depopulation and calamities of Lodi and of Pisa; it is the same with antient history. We see Rome growing and thriving, but we are apt to overlook the numerous towns of Latium and of Samnium which were annihilated through her predominance. Several causes contributed to keep up the wealth of the great Lombard cities during the middle ages; the extraordinary fertility of their territory, their manufactures, in which they were unrivalled in Europe, and the practice of their citizens of lending money at high interest throughout Europe, from whence the name of Lombard became synonymous with that of banker as well as usurer. But however flourishing the cities might be, the subject country had little participation in their splendour, and the greatest sufferers in the continual wars between them were the unfortunate country-people, who in all these republics had no political rights, had no voice in these quarrels, but were doomed to suffer from both parties, who treated them like dogs. The chronicler Ferratus of Vicenza makes an appalling sketch of the sufferings of the rural population, of which Sismondi gives an extract in ch. xxviii. of his history.

In the contests between the popes and Frederic II. the Lombard cities were divided: Milan, Brescia, Piacenza, and Modena were against the emperor; Cremona, Parma, Modena, Reggio, were for him. But his most effective ally was Eccelino da Romano, whom the Veronese had made their podestà, and who contrived in the midst of the confusion to make himself master not only of Verona, but also of Vicenza and Padua, and all the Marches. In 1237 Frederic attacked the Milanese and their allies at Cortenova, near the river Oglio, and completely defeated them. Still the emperor was prevented by other accidents from pursuing his advantage, and Milan was saved. A desultory war continued till his death.

Meantime renewed affrays between the nobles and the burghers of Milan induced the latter, who were dissatisfied with the podestà for favouring the nobles, to have a distinct podestà, or magistrate for themselves, as they had already a separate credenza and separate consuls. They chose for this office Pagano della Torre, lord of Valsesina, a powerful feudatory, who had been of great use to the Milanese after the defeat of Cortenova, and they styled him 'Protector of the people.' The nobles had now for their champion the archbishop Fra Leone da Perego, a fanatical monk, who distinguished himself by his subserviency to the pope, and his zeal against the Cathari, a kind of heretics, many of whom were burnt at Milan. On the death of Pagano della Torre, the people chose his nephew Martino for their chief magistrate, with the title of 'Elder,' 'Anziano della Credenza,' for an indefinite time. He was afterwards styled 'Signor del Popolo,' 'lord of the people.' The nobles chose for their podestà Paolo da Soresina. Martino however had the advantage, and expelled Soresina. The nobles had then recourse to Eccelino da Romano, who ruled Vicenza and Verona, and had also taken Brescia. He advanced towards Milan with a splendid army, crossed the Adda, but found himself hemmed in by enemies on all sides, his own former friends Oberto Pelavicino of Cremona and Buoso di Doara, both Guibelines, having turned against him. He attempted a retreat, but was wounded and taken prisoner, and died of his wounds, in October, 1259.

The exiled nobles of Milan still kept the field, and Martino della Torre, unable to reduce them for want of cavalry, engaged Pelavicino and his troops in the service of Milan, with the title of captain-general for five years and a pension. This was the beginning of the practice so prevalent afterwards of hiring mercenary troops, or condottieri. The Milanese emigrants were besieged in the castle of Tabiago, near Brianza, where having exhausted their provisions and the water of the wells, and their horses having died, they surrendered at discretion. They were taken to Milan in chains, and confined in iron cages exposed to public view, and kept there for years.

In 1260 Martino della Torre was chosen by the towns of Lodi and Novara as their 'signore,' or lord, which in those small communities implied a more absolute authority than that which he had at Milan. The fashion spread; Cremona chose for its lord the marquis Pelavicino; Verona chose

Martino della Scala; Mantua, the count San Bonifazio; Ferrara, the marquis of Este, &c. The desire of tranquillity and repose from factions induced the citizens to submit to a chief who could make himself feared, and they chiefly required of him to punish quickly and severely those who troubled the public peace. They preferred summary and often brutal justice to anarchy.

After the death of Archbishop Perego the chapter was divided, as to the choice of his successor, between a nephew of Martino della Torre and another. Pope Alexander IV., who was offended with Martino for having allied himself with Pelavicino, a Guibeline, and suspected of heresy, named to the see the canon Otho Visconti, of a noble and powerful family, who had been exiled with the other nobles some years before. But as the Della Torre opposed his coming to Milan, considering him as an emigrant, the archbishop elect continued for several years to remain on the estates of his family near the lake of Como, where he collected many of the disaffected, with whom he carried on a sort of predatory warfare against Milan. Martino della Torre having died in 1263, his brother Philip succeeded him as lord of Milan, Lodi, and Novara, to which he added Como, Vercelli, and Bergamo, which towns elected him as their lord. Thus the foundation was laid of that consolidation of Lombardy into one state which in after-times was known by the name of the duchy of Milan. Philip della Torre died in 1265, and was succeeded by his nephew Napoleone della Torre. The Torriani, or Della Torre family, did not alter the form of the institutions of Milan; the podestà, the credenza, and the consuls remained as before, with an authority independent, apparently at least, of that of the lord. This policy was the same as that pursued by the first Medici at Florence.

As long as Pope Gregory X. lived, the archbishop Visconti was cautious in his movements, as that wise pontiff did not choose to encourage the preponderance of either Guelphs or Guibelines; but after his death in 1276 Visconti grew bolder; he took possession of Como and Lecco, and at last marched against Milan. Napoleone della Torre came out to meet him, but was surprised and taken prisoner, and he and his relations were confined in cages, after the example set by his uncle Martino. The people of Milan, hearing of the defeat, rose against the adherents of the Torriani, pelted them with stones, and drove them out of the city. A deputation of citizens was sent to the archbishop Visconti, whom they saluted as 'Perpetual Lord of Milan.' This occurred in January, 1277. 'It was but one dynasty supplanting another. The Torriani, who had raised themselves by acting the part of demagogues, introduced monarchical habits, depressed the nobles, and drove them into exile. The Visconti, returning at the head of this long-proscribed nobility, which was now ruined in fortune, and had become mercenary, found the people corrupted by servitude. There was no longer any independence of spirit in any class, no elevation of character or love of liberty; and although republican councils and popular institutions continued for a long time after, the principle of life which once animated them was extinct, and the sovereign power was transmitted by the first and virtuous Visconti to their imbecile and vicious descendants, without the nation attempting to recover it from their grasp.' (Sismondi, *Républ. Ital.*, ch. xxii.)

The power of the Visconti, though in fact hereditary, was at first, at least in form, dependent on the sanction of the people, who, at the death of the actual lord, elected his successor. The council of the elders continued to discuss the laws which the lord proposed, to levy the taxes, superintend the expenditure, and to exercise the other functions of a legislature. But gradually, and especially from the time of Bernabò Visconti, the lord took upon himself to issue his own laws or statutes, to impose taxes, let to farm the revenue, make war, and, in short, exercise all the acts of sovereignty. In the fourteenth century the Visconti ranked among the most powerful Italian princes. They extended their dominions not only over Lombardy Proper, north of the Po, but over part of Montferrat, including Asti, Alessandria, Bobbio, Tortona, and also to Parma, Piacenza, Bologna, and other towns south of the Po. Gian Galeazzo Visconti received in 1395, from the Emperor Wenceslas, the title of 'Duke of Milan and Count of Pavia.' The charter of investiture included twenty-six towns and their territories, extending from the hills of Montferrat to the lagoons of Venice. Besides these he obtained also possession by force or fraud of Genoa, Lucca, Pisa, Siena, Perugia, Bologna, and other parts of Romagna. Florence alone stood in his way, and he was preparing to attack it with all his forces, when he died of the plague, in September, 1402. In the following century the duchy of Milan became circumscribed within narrower limits. The Venetians took the three provinces of Brescia, Bergamo, and Crema, between the Mincio and the Adda, which last river became the boundary of the two states. The Swiss took possession of Bellinzona, and other valleys north of the Lago Maggiore. The duchy of Milan likewise lost its conquests south of the Po. On the side of Piedmont its boundary was the Sesia, including within its limits the extensive province of Novara, which now forms part of the Sardinian territories. The duchy of Milan therefore, as possessed by the later Visconti and their successors the Sforza, from whom it came into possession of Charles V., extended about 70 miles north to south from the Alps to the Po, and 60 miles east to west. Its principal cities were Milan, Pavia, and Cremona. Mantua formed a separate duchy until the war of the Spanish succession, when it was taken possession of by the house of Austria, and annexed to the duchy of Milan. These two duchies constituted Lombardy Proper. The duchy of Milan, during a century and a half that it remained under the Spanish branch of the house of Austria, declined greatly from its former prosperity. The delegated absolutism of Spanish viceroys and governors was fatal to Milan, Naples, and Sicily. The wretched system of that administration and the misery of the population subject to it have been admirably portrayed by Manzoni, in his 'Promessi Sposi,' and by Cantú, in his 'Ragionamenti sulla Storia Lombarda del Secolo xvii.,' which is a commentary on the work of Manzoni.

With its transfer to the German branch of the house of Austria Lombardy began to recover its prosperity. But it was under the reign of Maria Theresa that improvements of every sort proceeded with rapid strides, and the duchy of Milan assumed a new aspect. The population also increased rapidly. In 1749 it was 900,000, and in 1770 it was 1,130,000. Joseph II. pursued the career of improvement in Lombardy, and Verri, who wrote his history of Milan at the time, remarked upon the dense population of this limited tract of country, and its fertility, which, besides abundantly supplying its inhabitants with all the necessaries of life, left them an annual surplus of produce for exportation to the amount of 1,350,000 sequins, about sixteen millions of francs. The consequence of all this was, that the people of Lombardy grew attached to the Austrian sway, and when the French, in 1796, invaded the country, they found the inhabitants in general extremely cool towards them and their republican doctrines. The partisans of the French gathered from other districts, from the Venetian provinces of Bergamo and Brescia, and also from Modena, Bologna, and other countries south of the Po, which were not so well administered as the Milanese. The subsequent vicissitudes of Lombardy are noticed under the LOMBARDO-VENETIAN KINGDOM.

LOMBEZ. [GERS.]

LOMBHOOK, or LOMBOK, an island of the Indian Archipelago, lying between 8° and 9° S. lat. and 116° and 117° E. long. It has the island of Bali on the west, and that of Sumbhawa on the east. The form of Lombhook is nearly square; its mean length and breadth being respectively 53 and 45 miles. The surface of the island is mountainous. The loftiest of its mountains, the peak of Lombhook, is said to rise to the height of 8000 feet above the level of the sea. The island is populous and well cultivated, and the whole surface is covered with verdure. It is abundantly supplied with springs of water, which feed several small streams; some of which fall into the sea on the west side, where there is a commodious harbour. Ships which enter the harbour may procure from the natives abundant supplies of oxen, swine, goats, poultry, and vegetables. The inhabitants, who are generally intelligent, and have attained a considerable degree of civilization, carry on a brisk traffic with Java and Borneo; their chief food is rice, which they cultivate by means of large tanks and reservoirs of water. The ruler or rajah of Lombhook is tributary to the sultan of Bali, and the island has never been brought under subjection by any European power.

LOMOND, LOCH, is a lake in Scotland, extending between 56° and 56° 20′ N. lat., and 4° 30′ and 4° 42′ W. long., in a direction from north by west to south by east On the east side it is bounded by the counties of Stirling and Perth, and on the west by that of Dumbarton. Its length is 24 miles. The most southern portion, which is nearly one-third of its length, is from four to seven miles across, and contains several wood-clothed islands. The whole number of islands in the lake is about thirty. North of Luss in Dumbartonshire it grows gradually narrower, being from two to one mile and even less in width. According to the 'Statistical Report of Scotland' it covers a surface of 45 square miles. Its general depth is about 20 fathoms, but in some places it is as much as 80 and even 120 fathoms. The surface is 22 feet above the mean level of the sea at Dumbarton. Its waters are supplied by a great number of small rivers, which descend from the adjacent mountains; the Enrick, the only considerable stream which falls into it, enters the lake on the east side, at that part where it is widest. The circumstance of so many streams falling into it will account for the fact of the surface of this lake being from three to five feet higher in winter than it is in summer. The river Leven, which issues from its southern extremity, carries the surplus waters to the Clyde. Loch Lomond is well known for the grand and beautiful scenery which its banks exhibit: indeed none of the Scottish lakes present a greater variety of landscape. The river Leven runs through a valley of considerable width, which is highly cultivated. The country around the southern portion of the lake is hilly, but fertile, rich, and well cultivated: it contains a number of gentlemen's seats, surrounded with fine natural woods and plantations, while the lake gives a peculiar charm to the scenery by its rocky but beautiful and finely-wooded islands. Where the lake begins to narrow, Ben Lomond on the eastern bank raises its head to near 3000 feet above the sea. Ben Lomond is a beautiful mountain, rising with a gentle ascent, and covered with fine grass to the very summit. Its beauty is increased by contrast with Tullich Hill and the mountains of Arroquhar, which rise on the other side of the lake with a steep declivity and bare and rocky summits, to nearly the same elevation as Ben Lomond. The northern extremity of the lake is completely enclosed by high, steep, rocky, and dark mountain-masses.

LOMONOSOV, MICHAEL VASILIEVITCH, the father of modern Russian poetry and literature, was born in 1711, near Kholmogor, in the government of Archangel. His father, who was a serf of the crown, was by occupation a fisherman, and Michael more than once accompanied him in fishing excursions in the White and Northern seas. The long winters were devoted by him to study, in which he was assisted by the instruction he received from a priest; and although his stock of books was exceedingly limited, being nearly confined to a grammar, a treatise on arithmetic, and a psalter, he made such diligent use of them, that at last he had them all by heart. What he thus acquired served only to increase his desire for further information: he accordingly determined to make his way at once to Moscow, to which capital he journeyed in a cart that was conveying thither a load of frozen fish. Having greatly distinguished himself, first in the Zaikonopaski School there, and afterwards in the university of Kiev, he was sent to complete his education at the Academy of St. Petersburg in 1734, where he applied himself more particularly to mathematics, physics, chemistry, and mineralogy. After two years spent in those studies he was sent to Marburg, in order that he might perfect himself under the celebrated philosopher Christian Wolff, under whom he continued three years, and then proceeded to Freyburg, for the purpose of acquiring a practical knowledge of metallurgy and mining. Yet although chiefly occupied by such pursuits, he did not neglect literature, but diligently read all the best German poets of that period, and determined to rival them. One of his first literary efforts was an ode on the taking of Khoten, which he sent to the empress Anne, and which obtained for him general admiration. In the meanwhile he had married during his residence at Marburg, the consequence of which was that he so involved himself in pecuniary difficulties, that he was obliged to lose no time in returning to his own country. After his arrival at St. Petersburg he was made an associate of the Academy in 1741; and in 1746, professor of chemistry, besides which other appointments and honours were conferred upon him, and in 1760 he was made rector of the gymnasium and university. He died April 4 (16), 1765.

The complete collection of his works, published by the Academy, which has passed through several editions, extends to sixteen volumes; and the titles alone of his works would serve to show the great range and diversity of Lomonosov's studies. It would in fact be difficult to name any one who can be compared with him for the encyclopædical multifariousness of his writings. Chronology, history, grammar, rhetoric, criticism, astronomy, physics, chemistry, meteorology, poetry—all engaged him by turns, and he showed himself to have a genius for all. Later discoveries and improvements in science have of course somewhat dimmed the lustre which his writings of that class at first shed upon his name; but the service he rendered to the literature of his country, both by precept and example, no length of time can obscure. His grammar entitles him to be considered the legislator of the language, and as the first who gave regularity and stability to its elements: in poetry he has scarcely been equalled by any one, with the single exception of Derzhavin, in energy of style and sublimity of ideas; notwithstanding that, unlike those who have succeeded him, he found no model to guide him in any of those who had gone before him, but had to purify and recast the language in which he wrote. Polevoi's biographical novel, entitled 'M. V. Lomonosov,' 2 vols., 8vo., 1836, contains, with some admixture of fiction, almost all that can now be collected regarding the life of this extraordinary man, together with notices of his chief literary contemporaries.

LONCHE'RES, Illiger's name for a genus of *Rodents*, including *Echimys* of Geoffroy, a species of *Hystrix* of Schreber and others, and a species of *Myoxus* of Zimmerman and others. [MURIDÆ; RODENTIA.]

LONCHO'PTERIS, a genus of fossil ferns established by M. Adolphe Brongniart. The species belong principally to the coal formation, but one, Lonchopteris Mantelli, is found in the Wealden deposits and in the green-sand.

The leaves are multipinnatifid, the pinnicules adnate to the rachis, marked by a midrib, and equal reticulated nervures, and uniform areolæ.

LONCHU'RA, a genus of *Fringillidæ*, separated from *Fringilla* (Temm.), by Lieut.-Col. Sykes.

Generic Character.—*Bill* strong, short, broad; mandibles entire, the upper one extending in an angle on the forehead, and, with it, forming the arc of a circle. Wings moderate, subacuminate; first *quill* very short and subspurious; the second, third, and fourth, nearly equal and longest. *Tail* graduated, lanceolate; middle tail feathers a little exceeding the others in length. *Feet* moderate, rather slender.

Col. Sykes observes that the peculiar spear-head form of the tail, and the ridge of the upper mandible and the forehead, forming a segment of the same circle, together with the habits of *Lonchuræ nisoria*, *Cheet* and *leuconota*, afford sufficient characteristics for their separation. Col. Sykes adds that the *Gros-bec longicone* of the Pl. Col. 96 (*Emberiza quadricolor*, Lath.), belongs to the same group.

Locality of the three species the Dukhun (Deccan). The first two are recorded as found only in the Ghauts.

Lonchura Cheet, Sykes, is described as of a pale cinnamon-brown; the body below and the rump white; quills and tail-feathers deep brown. Irides deep red-brown. *Female* with the colours less intense. Length of the body $5\frac{3}{8}$ inches; of the tail, 2.

Habits, Reproduction, &c.—Col. Sykes states that these birds live in small families, and that he frequently found them in possession of the deserted nests of the *Ploceus Philippensis*; their own nest, which he exhibited on a subsequent occasion, is a perfect hollow ball, made of a delicate *Agrostis*, with a lateral hole for the entrance of the birds. It was found in the fork of a branch of the *Mimosa Arabica*, and contained ten oblong minute white eggs, not much larger than peas, being $\frac{13}{20}$ths of an inch long by $\frac{2}{20}$ths in diameter. The cry of the bird is *cheet, cheet, cheet*, uttered simultaneously by flocks in flight. (*Zool. Proc.*, 1832 and 1834.)

LONDON, the capital of the United Kingdom of Great Britain and Ireland, stands at the head of the navigable tideway of the river Thames. The latitude of the centre of the dome of St. Paul's cathedral, which stands nearly in the centre of what is strictly the *City* of London, is 51° 30′ 47·59″, and the longitude is 5′ 48·2″ W. of Greenwich. The latitude of Greenwich Observatory, according to Mr. Airy's determination, is 51° 28′ 38·07″. This portion of the metropolis, the City, including the liberties or the districts into which the municipal franchises and vileges extend, is divided into two portions, Londo the Walls, and London without the Walls, a distinction which exists no longer except in name. The original wall of the City is described as having its beginning at a fort which in part occupied the site of the present Tower of London, whence it was carried northward through the street now called the Minories to Aldgate; thence diverging to the west it crossed Bishopgate churchyard to Cripplegate; then southerly to Aldersgate; thence to the north of Christ's Hospital; turning directly south to Ludgate, it then again took a westerly course to New Bridge Street, and accompanied the line of the Fleet River to its junction with the Thames, where another fort marked its termination. The space within the line thus described comprehends London within the Walls, and includes 98 parishes. London without the Walls consists of the following 11 parishes:—St. Andrew's, Holborn; St. Bartholomew the Great; St. Bartholomew the Less; St. Botolph Without, Aldersgate; St. Botolph, Aldgate; St. Botolph Without, Bishopgate; Saint Bride's; St. Dunstan in the West; St. Giles Without, Cripplegate; St. Sepulchre Without, Newgate; Trinity, in the Minories; besides inns of court, hospitals, and other extra-parochial districts locally connected with the above-named parishes. The whole of London Bridge is held to be within the city, together with a plot of ground at the south end of the old London Bridge on the Surrey shore, and called the Bridge-foot.

These boundaries by no means include what is now understood by the name London. They do not even circumscribe the surface over which its magistracy exercises jurisdiction. The borough of Southwark, on the south side of the Thames, is, for certain purposes, subject to the jurisdiction of the corporate officers of the City of London. A great part of the manor of Finsbury is also held by the corporation by virtue of a lease granted by the prebendary of Haliwell and Finsbury, in the cathedral church of St. Paul, at an annual rent. This lease has been renewed from time to time, and the date of its origin is not recorded; but it is known that the corporation has been thus interested in the manor from the beginning of the fourteenth century. It is now usual to consider it as forming part of the metropolis, or of London, in the large sense of the term, which comprehends the City of London within and without the walls, the city of Westminster, the borough of Southwark, and the newly-created parliamentary boroughs of Finsbury, St. Mary-le-bone, the Tower Hamlets, and Lambeth. The area of these several divisions, with the number of houses and of inhabitants which they contained at the census of 1831, are computed to be as follows:—

	Area in Acres.	Houses.	Population.
City of London . . .	600	17,315	122,395
Southwark	590	22,482	134,117
Westminster . . .	2,500	21,893	202,460
Finsbury	4,670	29,605	224,839
St. Mary-le-bone . .	5,310	27,888	234,294
Lambeth	8,840	29,079	154,613
Tower Hamlets . . .	8,988	66,777	302,519
Total . . .	31,498	215,039	1,375,237

The proportionate increase in the population and number of houses that has been found at each decennary enumeration since 1801 has been as under:—

	No. of Houses.	Inhabitants.
1811 ..	16·98 per cent.	16·73 per cent.
1821 ..	16·19 "	17·66 "
1831 ..	19·42 "	20·04 "

The rate of increase has been by no means uniform in the different districts. Comparing 1831 with 1801, the total increase in the number of houses has been 63 per cent., and in the population 70 per cent.; but as regards the city of London there has been, during the same thirty years, a positive decrease in houses of 5·65 per cent., and of inhabitants 4·43 per cent. The great increase has taken place in the newly-created boroughs; the houses being there augmented in the proportion of 94½ per cent., and the inhabitants 105 per cent. The area of the City being already fully occupied by houses, there was no room for their increase, and little capacity for receiving an addition to the number of inhabitants. The trifling diminution experienced in both particulars in the city is fully accounted for by the widening of streets, and by the increased value of houses for commercial purposes, which has induced many persons to parcel out their dwellings as offices, and to remove with their families to the suburbs.

No enumeration has of late years been made of the streets of London; but it has been computed that, including squares, lanes, courts, and alleys, they amount to between 8000 and 10,000. The principal thoroughfares follow the course of the Thames from east to west. The longest line enters from Essex at Whitechapel, and runs in a nearly straight line to St. Paul's cathedral, where it divides into two arms, one of which continues near the river through Fleet-street and the Strand to St. James's palace; the other arm continues more to the north, through Holborn to the western extremity of Oxford-street and Kensington Gravelpits. From a computation made in December, 1785, it appears there were then, 'in and near the City of London, 100 almshouses, 20 hospitals and infirmaries, 3 colleges, 10 public prisons, 15 flesh-markets, 1 market for live cattle, 2 for herbs, and 23 for corn, coals, hay, &c., 15 inns of court, 27 public squares, 49 halls for companies, 8 public or free schools, 131 charity schools, 207 inns, 447 taverns, 551 coffee-houses, 5975 ale-houses, 1000 hackney-coaches, 400 hackney-chairs, and 7000 streets, lanes, courts, and alleys.'

From the official returns obtained in 1832 by the commissioners appointed to consider concerning the division of counties and the boundaries of boroughs, it appeared that there were at that time in each of the proposed parliamentary divisions the following number of houses rated at the yearly value of 10*l.* and upwards, and the assessed taxes paid within those divisions were as follows:—

	Houses assessed at £10 and upwards.	Amount paid of Assessed Taxes.
City of London . .	14,564	£205,476
City of Westminster .	17,681	303,421
Borough of Southwark .	9,923	51,262
" Lambeth .	16,405	91,069
" Finsbury .	23,266	201,027
" Marylebone .	21,630	282,201
" Tower Hamlets	23,187	93,151
	126,656	£1,227,607

From which it appears that the metropolis contained 28·58 per cent. of the total number of houses rated above 10*l.* per annum value in Great Britain, and that the inhabitants paid 29·61 per cent. of the whole amount of assessed taxes, exclusive of the land-tax.

Soil, &c.—The general substratum of London and its vicinity is clay. [London Clay.] Beds of clay, from 100 to 200 feet in thickness, proper for making tiles, are found in the immediate neighbourhood of the City, and all around the metropolis brick-making is or has been carried on extensively. The clay is in many parts, especially on the north side of the river, for a distance of more than a mile, covered with a thick bed of gravel.

The mean annual temperature of the air *in* London, as deduced by Mr. L. Howard from a series of observations carried on during twenty years, is 50° 5′. The mean temperature of each month, during the period here mentioned, was—

	°		°
January .	36·34	July .	62·97
February .	39·60	August	62·90
March . .	42·01	September	57·70
April . .	47·61	October	50·79
May . .	55·40	November	42·40
June . .	59·36	December	38·71

The amount of rain which fell in each of the nine years, from 1826 to 1834, in the gardens of the Horticultural Society at Chiswick, and in each month of the year 1834, was as follows:—(It is not known that there is any gauge kept within the limits of the town upon which perfect reliance can be placed.)

	Inches.	1834.	Inches.
1826	21·83	January .	2·87
1827	22·18	February .	0·37
1828	27·85	March .	0·86
1829	26·12	April . .	0·65
1830	24·27	May . .	1·19
1831	26·93	June . .	1·63
1832	21·59	July . .	6·34
1833	25·80	August .	2·73
1834	20·39	September	0·83
		October .	0·43
Average	24·10	November	1·75
		December	0·74
			20·39

According to observations made during a series of years he following table shows the directions in which the wind as blown during each month of the year:—

	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.
anuary	3½	4½	1½	2¼	1¾	6½	6½	4½
ebruary	1½	4¾	2½	2¾	2¼	5	5½	3¾
arch	2½	4	—	2	2¼	9½	6¼	4½
pril	2½	3¼	3	3½	2¾	4	5½	5½
ay	3	4	4½	4	1	6¾	5¼	3
une	5	6½	2	4	1	3½	3	5
uly	2½	3	2	4	2¼	7	5	5¼
ugust	1	2¾	1½	3	2¼	6	11½	3
eptember	2	4	1	4	1	6	6	6
ctober	3	3¾	2	3½	2½	5¾	5	6¼
ovember	3	3	3	2	3	6	5	5
ecember	1	2¼	3½	4	2	8¼	6	4
	30½	45¼	26½	39	23¾	73¾	70½	55¾

Architecture.—Although London is known to have existed a town for near two thousand years, with the exception of re and there a building, or a mass of old tenements, all e rest is comparatively of yesterday, there being very few rtions which are more than a century old, and those in uations where they must be purposely sought out. What man London was is now entirely matter of conjecture, although pavements and other fragments of antiquity ve been from time to time discovered, they merely prove at Roman structures of some splendour formerly existed the sites where such remains have been dug up; but in gard to the buildings themselves they afford no informa- n; still less do they assist us in forming any idea of the neral mode of building and the aspect of the city. Ima- ation may speculate freely as to the grandeur of Lon- ium under the Roman sway, but it is impossible for it to eat us into the idea of the city's presenting any signs of ndeur in after-times, for under both its Anglo-Saxon d Norman sovereigns it must have been, as we shall pre- tly see, in a most wretched condition, and its inhabit- ts subjected to what would now be considered intolerable isances and inconveniences. Londinium was most pro- bly a British town, that is, a large enclosure protected by ampart and fosse, previous to the invasion of the island Cæsar, in whose time a considerable traffic was carried between the Britons and the Gauls. But though Cæsar ossed the Thames, he makes no mention of Londinium. e first notice of it occurs in Tacitus (*Ann.*, xiv. 33), where is spoken of as not then honoured with the name of a lonia, but still as a place much frequented by merchants d as a great depôt of merchandise. In the revolt of adicea (A.D. 62) Suetonius, the Roman commander, aban- ned Londinium to the enemy, who massacred all the in- bitants who did not leave it with Suetonius; a circum- nce which leads us to infer that it was then chiefly occu- ed as a Roman station. If any conclusion can be drawn m the brief notice of Tacitus, London was then incapable making any defence, and had probably no wall that could sist the enemy; though that historian mentions the want of ldiers as the cause of its being abandoned by Suetonius. does not appear from Tacitus whether the place was en destroyed by the Britons. At a later date London pears to have been made a colonia under the name of ugusta. (Amm. Marcell., xxvii. 8.) The antient wall of ondon, ascribed to Theodosius, governor of Britain, began a fort near the present site of the Tower, and continued ong the Minories, to Cripplegate, Newgate, and Ludgate. he walls are said to have enclosed an area of somewhat ore than three miles in circumference, and to have been uarded by fifteen towers, which latter are conjectured to ave been 40 feet high, and the walls 22. The prætorium d its adjuncts are supposed to have occupied the site of e Poultry and Cornhill, as tesselated pavements have been iscovered there and at the Lothbury gate of the Bank, and ear St. Mary's Woolnoth.

In regard to Anglo-Saxon London, our information is as anty as it is with respect to the Roman city; but we may asily conceive that it must have greatly fallen off in appear- nce during the barbarous period that succeeded the final eparture of the Romans from the island, when it was lternately attacked and ravaged by the Picts and Scots, y the Saxons and Angles. In the sixth century it became the capital of the Anglo-Saxon kingdom of Essex, and in the following one a bishop's see. Sebert, king of Essex, having been converted to Christianity, erected a cathedral church to St. Paul, and an abbey church to St. Peter, on the sites of the present cathedral and Westminster Abbey. All however that we know of London, till for many centuries afterwards, extends no further than a few sites and names, the memory of which has been preserved, notwithstanding the successive changes to which the places themselves have been subjected. At this period and for long after, the city could have been little more than an assemblage of hovels, intersected by narrow miry lanes, the whole enclosed by walls, except on the side towards the river. It was on the banks of the river, in Castle Baynard Ward, and on the south side of the present cathedral, that the residence of the Anglo-Saxon kings stood, erected either by Alfred, Edward, or Athelstan; most probably by the last, whose name is retained in that of Adel or Addle Hill. This Anglo-Saxon palace was forsaken by Edward the Confessor, who removed to that which he had erected at Westminster; after which, together with the cathedral, the first-mentioned building was destroyed by fire in 1087. The Tower Royal (at the end of the street so called) was another palace, erected after the Norman conquest, but its origin cannot be traced. In Richard II.'s time it was called the Royal Wardrobe, and was granted by Richard III. to the first duke of Norfolk.

Of public buildings there were scarcely any besides religious houses and hospitals, both which were very numerous previous to the Reformation, and of several of them the names are retained at the present day, viz. Black Friars, White Friars, Crutched Friars, Chartreux (the Charterhouse); Priories—St. John of Jerusalem, Clerkenwell (St. John's Gate), St. Bartholomew the Great, St. Mary Overies, Southwark; Nunneries—St. Helen's, Bishopgate Street, and Holywell, in Holywell Lane, Shoreditch; Hospitals—St. Giles's, St. James's (the Palace), St. Katherine's, and St. Thomas's. What few residences there were of any note were scattered about, and mingled with the meanest habitations: that of Henry, earl of Northumberland in the time of Henry VI., stood in Fenchurch Street; Crosby House (1470, a portion of which still remains, and has lately been restored), in Bishopgate Street. Oxford Place, the residence of the Veres, earls of Oxford (1598), was in St. Swithin's Lane, where were the houses of Sir Richard Empson and Dudley, the notorious agents of Henry VII.; and that of Cromwell, earl of Essex, stood in Throgmorton Street, while at a later period Aldersgate Street and other places now abandoned to shops, counting-houses, and warehouses, were inhabited by the noble and the opulent. The antient residence of the bishops of London was in Aldersgate-street.

As to the actual appearance and condition of the metropolis we have little more than conjectural and piecemeal information until we come down to times that may comparatively be termed recent; for contemporary chroniclers and topographers seem to have had no regard to the curiosity of posterity; but contented themselves with noting, whether briefly or prolixly, most drily, what they beheld, without aiming at anything like a graphic description of the whole. We may however easily picture to ourselves what London must have been even in the first half of the sixteenth century, when the act for improving and paving the city, passed in 1532, describes the streets as 'very foul and full of pits and sloughs, very perilous and noyous as well for all the king's subjects on horseback as on foot, with carriages.' If to the formidable inconveniences to which passengers and traffic were subjected, we add those of narrow crooked streets, gloomy by day and left in total darkness at night, we shall be forced to add a few shades more to the picture of the *noyous* condition of the citizens. Perhaps even the vilest bye-lanes, alleys, and courts that are now to be met with, are, except in regard to the houses themselves and their inhabitants, hardly a degree worse than was the London 'of olden times' generally. No wonder therefore that pestilence and fire should at various times have committed such havoc, the population being densely cooped up in confined and badly ventilated dwellings, constructed for the greater part of plaster and timber, covered with thatched roofs, and having each story overhanging that immediately beneath it. While this last-mentioned circumstance must have contributed not a little to unhealthiness by leaving very little space between the uppermost stories of the oppo site houses, it must also have rendered fires particularly destructive, so that what with the denseness of the buildings, the combustibility of their materials, and an insufficient supply of water, the breaking out of a fire must have threatened a conflagration of a whole neighbourhood, as is still the case at Constantinople. At the present day such a conflagration as that of the great fire of 1666 would be almost impossible, even if no efforts were made to arrest its progress.

Though churches, religious houses, and some few private residences may have been substantially built, and perhaps entitled to the epithet of magnificent, especially when compared with the ordinary dwellings, they must have been altogether insufficient to counteract the general rude and mean appearance of the city. Whatever degree of comfort or even luxury there may have been in the abodes of a few great nobles, there can be no doubt that the people generally, even including the wealthier burghers, were miserably lodged and housed. The exceptions from it are not to be mistaken for the rule itself; and if we contrast the condition of society class by class, we find that, setting aside the very highest, by whom greater state was affected than at present, all the rest will bear no comparison with the corresponding ones of modern times as regards the comforts of life. Many things which were formerly the luxuries of the few have since become the every-day necessaries of the many; to say nothing of the numerous conveniences and enjoyments now placed within the reach of nearly all, though, a century or two ago, no wealth could procure them. The pictures given us by Erasmus and Holinshed of the manners and domestic economy of our ancestors, so far from being at all flattering, portray a state of semi-barbarism; so that whatever occasion there may have been for regulating attire and restraining luxury in dress, there was no need of sumptuary laws to check excess of refinement in houses and furniture. In the early part of the fifteenth century even 'the uplandish towns in the realm' could not boast of more than three or four chimneys; and afterwards the houses of the English were described by the foreigners who came over with Philip II. as consisting of walls built with 'sticks and dirt.' In the metropolis the generality of the houses may have been a degree better; yet Holinshed himself admits that London had a very mean appearance in comparison with most foreign cities. During the sixteenth century however it greatly extended itself westward along the north bank of the river, where many of the nobility erected 'fayre and statelie' mansions, of which Northumberland House is the only one remaining, no traces of the others being left, although the names of several of them are still retained in the streets opening into the Strand. Even Exeter 'Change, which occupied the site of Exeter House, originally built by the great Lord Burleigh, has in its turn disappeared, and transmitted its name to the present Exeter Hall. Still greatly as the metropolis had increased in extent in the reign of Elizabeth, the map of it at that period (a cut of which may be seen in the 'Penny Magazine,' No. 427), shows it to have been a mere dwarf in comparison with its present gigantic dimensions: all to the north and west of the Strand was open fields and country, as well as nearly all the south bank of the river, now a populous and extensive district, and connected with the northern side by several bridges, whereas before the erection of Westminster Bridge (commenced 1739), London Bridge was the only structure of its kind which the metropolis possessed. Insignificant as the increase of buildings in Elizabeth's reign may now appear, it was regarded with so much apprehension as well as wonder at the time, that the queen issued a proclamation in 1580, forbidding the erection of any but houses of the highest class within three miles of the city. The same was done by her successor, but in neither case had the prohibition much effect; so that by 1666 many new districts and parishes had been added to the suburbs. Terrible as was the calamity which during that year befel the city itself, when upwards of 13,000 houses and other buildings, including St. Paul's cathedral and the portico added to it by Inigo Jones, fell a prey to the flames, it has been attended with much benefit. 'Heaven be praised,' exclaims Malcolm, 'Old London was burnt!' and indeed what is chiefly to be regretted now is that advantage was not taken of the opportunity then afforded of laying out the streets with greater regard to regularity and convenience. A plan for that purpose was made by Sir Christopher Wren, and another by Sir John Evelyn. If either of them had been carried into execution, the City would have been infinitely more commodious for traffic than it now is, notwithstanding the very material improvements which have taken place within the few last years, by opening a communication from New London Bridge to the Mansion House and Bank, and thence northwards to Finsbury Circus. According to Wren's plan there would have been two principal streets carried in a direct line, one from Aldgate, the other from the Tower, intersecting in their course one or two open polygonal areas or piazzas (from which other streets would have branched off), and terminating in a larger triangular piazza, in which St. Paul's would have been placed, and from which another street would have been carried in a straight course to Temple Bar. Evelyn's plan also provided for several piazzas of various forms, one of which would have been an oval with St. Paul's in the centre of it; but it differed from the other in proposing a street in a line from St. Dunstan's in the East to the cathedral, and then straight onwards to Temple Bar; but this plan did not, like Wren's, contemplate a continued quay or terrace along the river. Unfortunately the singular obstinacy and narrow-mindedness of the citizens set them both aside; the extraordinary opportunity for improvement which then presented itself was entirely thrown away, and instead of being in any respect calculated to show that noble pile to advantage, the area in which St. Paul's stands is as irregular and unarchitectural as it is inconvenient.

Within the course of the next hundred years from this date the metropolis extended itself considerably to the west and north-west, where it became more fashionable to reside; and no doubt the fire of London had a great share in this change, for their mansions in the city having been destroyed by it, the nobility removed from that seat of bustle and traffic much earlier than they otherwise might have done. Both Soho Square and Golden Square (now places of very inferior rank to the more modern ones) were built before the close of the seventeenth century; while Hanover and Cavendish Squares appear to have been erected between the years 1716 and 1720. In the reign of George II. arose three churches, each of which is distinguished by a noble Corinthian portico, viz. St. George's, Bloomsbury (consecrated 1731); St. Martin's, and St. George's, Hanover Square (1742). The first of these however has not obtained a reputation equal to that of the second, notwithstanding that it ought to place the name of Hawksmoor at least on a level with that of Gibbs. [HAWKSMOOR; GIBBS.] In 1700 Old Bond Street was partly built, but its situation was then almost rural, all to the north being fields, lanes, and uncovered ground; and many mansions which are now surrounded by buildings and streets for a considerable distance, then stood, if not quite solitary, with only a few straggling houses in their neighbourhood; such was the case with Montague House, now the British Museum, and Burlington House, Piccadilly.

Notwithstanding however that other squares and streets continued to be progressively formed, until the district on the north of Piccadilly assumed a connected town-like appearance, neither that nor any other part of the metropolis bore much resemblance, in character and aspect, to what it now does, the houses having been all, if not rebuilt, more or less modernized since that time. As one instance of this, we may observe that no one would be able to recognise St. James's Street as shown in one of the plates of Hogarth's Rake's Progress, were it not for the gateway of the palace, the only feature that remains unaltered. The town might have gone on increasing to its present bulk; yet unless improvement had kept pace with its growth, it would have been far different from what it actually is; and we should at this day have had to contend with all the inconveniences described by Gay in his 'Trivia, or Art of Walking the Streets,' which appear to have been formidable enough, both in rainy weather and after nightfall.

It was not till the beginning of the reign of George III., when the present system of paving and lighting the streets was introduced, that the metropolis began to put on a civilised appearance, by the safety and convenience of the public being attended to. Signs, posts, waterspouts, and all similar nuisances and obstructions were removed; footpaths were laid down, and lamps were lit at night. It is true the foot-pavements were exceedingly scanty, and the oil-lamps diffused a light just as scanty—certainly not brilliant enough to extinguish all at once both flambeaux and link-boys. With the exception of this very important improvement, and the increase of building, little advance was made in the architecture of the metropolis during the latter part of the last century. Almost the only public edifices of this time at all entitled to the epithet of magnificent were Somerset House and the Bank; which latter however may with equal propriety be considered as belonging to the present century, since it was not completed as at present till about 1826. The Adams indeed erected the Adelphi, Portland and Stratford Places, and two sides of Fitzroy Square; yet these can scarcely be considered as public works, and as specimens of street architecture are (at least the first-mentioned) of exceedingly questionable taste, although they may fairly be allowed to be handsome in their general air and appearance. The Adams however are entitled to the praise of having improved the general style of ordinary house-building, and of having substituted convenience, cheerfulness, and lightness for the incommodiousness and heavy taste which formerly prevailed. The Pantheon, in Oxford Street, by James Wyatt, ought perhaps to be mentioned as a piece of architecture of some note, belonging to the latter half of the last century; but it no longer exists, save in name alone, being now totally altered, except some portion of the façade, which in itself displays no very great taste, and has not sufficient size to give it importance, while the interior is now converted to a very different purpose from its original one. As buildings, none of the theatres can be dated farther back than the present century, at the commencement of which, or about 1803, we may observe that Russell Square (the nucleus of a cluster of other squares that have risen up in its immediate neighbourhood) was first formed. Covent-Garden Theatre, the first production of Sir R. Smirke, and almost the first specimen of the Grecian Doric style in the metropolis, may also be considered as the beginning of a new era in its architecture; or rather it has so happened that it has been followed by numerous other structures and improvements, which have given (at least as far as they extend) quite a different aspect to the town.

Whatever they may be in regard to architectural taste, or however objectionable when examined in detail, it cannot be denied that both Regent Street and the Regent's Park were magnificent improvements, and have, moreover, led to a variety of others. They have certainly created a taste for a degree of architectural display that would formerly have been considered quite prodigal; and if that taste be in many instances very bad—not to say paltry,—it is upon the whole preferable to the dull monotony that used, as far as their architecture was concerned, to characterize even the best of the trading streets in the metropolis. The Strand affords a very fair comparison between the old and new modes of building, the houses being of the same class, though very different in architectural character; and as even the most prejudiced can scarcely hesitate to decide in favour of the latter, it may be almost taken for granted, not only that attention to appearance is more studied than it used to be, but that the condition of shopkeepers and tradesmen is improving likewise. The alterations occasioned by the building of New London Bridge, and forming approaches to it, in consequence of the change of site, have already greatly metamorphosed that part of the city, and awakened a spirit of improvement which bids fair to keep pace with that at the other end of the town. As to King William Street, much cannot be said in praise of the façades which it exhibits. The new range of buildings in Princes Street, at that extremity of it which was previously a most inconveniently narrow lane, has, on the contrary, a somewhat imposing air of noble simplicity. Moorgate Street too, which extends from the one just mentioned to Finsbury Circus, is decidedly better than that near the bridge. While it displays a pleasing regularity of design and uniformity of character, it does not offend by too great sameness and monotony, the elevations being broken into sufficiently distinct masses; besides which the houses have an air of greater loftiness than usual, owing to the breadth of the street not exceeding their height. When the Royal Exchange (destroyed by fire on the night of Jan. 10th, 1838) shall come to be rebuilt, it will no doubt lead to various other improvements in its immediate vicinity. In addition to this, it is in contemplation to form new streets where at present either no public thoroughfares exist or only such as are very crooked and narrow. Among these is one from the Post-Office to Lothbury and the Bank; another in continuation of Farringdon Street northwards; a third to open a direct communication between Holborn and the Strand, along the east side of Lincoln's Inn Fields. A similar project is now going on for improving the neighbourhood of Westminster, by means of a spacious street intended to lead from the west front of the Abbey to Pimlico. The necessity not only for these but for other improvements of the same kind must be tolerably apparent to any one who looks at a map of London; and among them would be a direct line of communication from the upper end of St. Martin's Lane into Oxford Street; another from Coventry Street into Covent Garden Market; and a third from Holborn into the Strand, to be obtained by widening and rebuilding the whole of Drury Lane.

With the exception of the terraces in the Regent's Park, Hyde Park Terrace near Bayswater, and that in St. James's Park—which are for the greater part more tawdry than rich in point of design,—none of the newer ranges of private houses make any pretension to architectural decoration; or if any thing of the kind be occasionally attempted, as in Eaton Square, &c., it is so meagre in itself and so grudgingly bestowed, as to be quite the reverse of satisfactory. Internally however the houses themselves are, in proportion to their size, far more commodious and better fitted up than those of half a century ago. All the newer parts of the town are likewise sufficiently airy and cheerful, owing both to the greater width of the streets themselves, and to the greater breadth of the foot-pavements and the areas before the houses; while, for the last reason, the kitchens are less gloomy and the foot-pavements less muddy than in the older and narrower streets. Besides this, another advantage is that the inhabitants are less exposed to the observation of their opposite neighbours; while the system of macadamization, now so generally adopted in squares and streets, has very much abated the nuisance of the rattling of carriages.. In fact, as regards the laying out, paving, and lighting of the streets, there is very little room for further improvement: there is however one serious inconvenience attending some of the widest streets which are frequented thoroughfares—the width of the carriage-way being so great as to render it hazardous to cross them when filled with carriages. This is particularly the case in Regent Street; yet the remedy for it is easy, as all danger and inconvenience to foot-passengers would be removed by erecting a lamp-post, with a few other posts around, at one or two crossings; besides which the roadway of the crossing would then be sufficiently lighted at night. In addition to the more obvious improvements as regards paving, lighting, the widening of streets, and removal of all obstructions in them, it should be mentioned that the salubrity of the metropolis has been greatly increased both by the supply of water and the present effectual system of drainage and sewerage.

Public convenience has been better consulted than it used to be by the erection of more commodious markets, in respect to which London was till lately not so well provided as Liverpool. Although not much of an architectural improvement, the present Covent-Garden Market is far more comfortable and commodious than the old one; and both Hungerford and Farringdon Markets (the former more especially) exhibit a most welcome change from the condition of their predecessors. The wonder lies not so much in the change itself, as that it should not have taken place sooner, shelter being almost indispensable for all such places in a climate so humid and rainy as ours, and which, if not kept dry, can hardly ever be kept clean. Of covered streets of shops we have as yet but two, namely, the Burlington and Lowther Arcades; unless we choose, as far as foot-passengers are concerned, to include also the colonnades of the Quadrant in Regent Street and the Opera House. The Lowther Arcade is of exceedingly handsome and tasteful design, and may be termed even luxurious in comparison with some of the narrow alleys and lanes with shops in the city, where however the example thus set has not been adopted. Somewhat akin to these arcades, or *passages*, as the French term them, are the bazaars which have of late years become so common, though formerly Exeter 'Change was the only place of the kind, and one moreover of most homely [illegible] mean appearance, compared with the highly decorated [illegible] of the Pantheon in Oxford Street. The Pantechnicon [illegible] Belgrave Square, is another very extensive establishment of a similar though not precisely the same kind.

Although, in comparison with many other cap- don is by no means rich in public collections of some advancement has of late been made even in this respect, both by the establishment of the National Gallery and the unreserved access now afforded to the British Museum, whose collections have been greatly increased in the present century. The Soanean Museum can as yet hardly be said to be open to the public. An effort has been made to have both Westminster Abbey and St. Paul's opened to visitors gratuitously; but it has hitherto been unsuccessful. In the meanwhile annual exhibitions are increasing: formerly there was only that of the Royal Academy; whereas there are now two at the British Institution, one for modern pictures, the other for works of the old masters; and that of the Society of British Artists, besides one or two of paintings in water-colours. To these may be added various other exhibitions of more or less recent origin, as dioramas, panoramas, &c. Formerly the 'lions' in the Tower and the animals at Exeter 'Change used to be far famed among the sights of London; but in lieu of them we have now the Zoological Gardens at the Regent's Park and the Surrey Zoological Gardens. In the course of a few years the Regent's Park will most probably possess another novel and attractive exhibition, it being intended to convert the whole of the inner circle into a botanic garden, with buildings and other ornamental accessories; and the mention of this reminds us that St. James's Park has been altered greatly for the better, it now presenting, instead of a mere meadow and formal canal, the appearance of a well laid-out pleasure-ground, with a lake studded by islets. The Adelaide Gallery, Lowther Arcade, and the Polytechnic Institute, Regent-street (opened August, 1838), afford proof of the diffusion of knowledge. The same remark applies to the various literary and scientific institutions, of which there is now some one or other in almost every quarter of the metropolis. Another class of establishments which, as now organized, may be said to be peculiar to our own times, are the club-houses, principally at the west-end of the town, which in some degree partake of the nature of places of literary as well as convivial meeting. Some of them are not only splendidly fitted-up and afford the most luxurious accommodation within, but are very conspicuous architectural objects. When the Reform Club is finished, the south side of Pall-Mall will consist almost wholly of these palace-like edifices, whose façades offer such a contrast to that homeliness of exterior which, with here and there an exception, prevails among what are internally splendid private mansions.

One innovation of very recent date, though long before demanded by a regard to public health, is the formation of cemeteries beyond the suburbs. Some years before anything of the kind was actually adopted, a scheme was brought forward for one to the north of the Regent's Park, but it failed probably from its having been on too gigantic and expensive a scale; for that necropolis was to have been a sort of mimic Athens, with facsimiles of all its temples and other buildings. The idea itself however was taken up by other parties, and the Kelsall Green Cemetery was formed about 1832. There are now two more; one at Highgate, the other at Norwood, both of which were executed chiefly in 1838, and a fourth and fifth are about to be undertaken at Brompton and Newington Butts.

Having thus far given a summary account of the growth of the metropolis, and of some of the principal changes occasioned by the increase of wealth, we should proceed to give some description of the more important public buildings; yet, unless we were to confine ourselves to merely one or two, which, as being the most noted, have already been described by others again and again, we should very greatly exceed all reasonable limits. We therefore adopt the more novel and convenient mode of exhibiting, in a tabular form and in chronological order, a list of such public buildings as are most worthy of notice on account of their architecture. This will at all events furnish a synoptical view of our metropolitan architecture, and were similar tables drawn up of the principal buildings of other capitals and cities, including some of our own large provincial towns, more exact information of the kind might be comprised in a few leaves than can otherwise be obtained by turning over a vast number of volumes. We shall however here prefix to the table itself a few general remarks on some of those buildings and others, more satisfactory perhaps than the very brief comments there inserted.

Of older architecture the metropolis now exhibits very little, with the exception of parts of the Tower, the Temple Church, Westminster Abbey and Hall, and one or two churches, such as St. Bartholomew the Great, and St. Mary Overies, at the south end of London Bridge, which was ably restored a few years ago. Other specimens that had been spared by fire have been swept away by improvement; among the rest the Savoy Palace and Ely House. But if improvement has in this respect been as merciless as fire, and, in the opinion of antiquaries, perhaps no less mischievous, it has at least cleared away the mass of unsightly buildings which formerly blocked it up the noble abbey of Westminster and the magnificent chapel of Henry VII. attached to it, both of them among the finest specimens of their respective styles. Wren's work however, in the western towers of the abbey, shows him to have had no feeling for Gothic architecture, which style did not begin to be revived in the metropolis until the present century. As the architect of St. Paul's, Wren is justly entitled to the reputation which he enjoys; and that noble edifice has procured for his other works more celebrity than they would otherwise have enjoyed; certainly more than they actually deserve. The greater part of the churches erected by him exhibit a heavy uncouth mannerism, with hardly a redeeming beauty. Even the steeples of Bow Church and St. Bride's have been greatly over-praised; the same remark applies to the interior of St. Stephen's, Walbrook, which derives its claim to elegance solely from its cupola and columns, all the rest being poor and trivial even to meanness. The few civic buildings which he erected were not in a more refined taste; nor would such structures as the former Fishmongers' Hall and Custom House, the old College of Physicians (now converted into a butchers' market), and Temple Bar, add to the reputation of any architect of the present day.

In the next age a different mode of design began to be adopted for churches, and those of St. George's, Hanover-square, St. Martin's, and St. George's, Bloomsbury, which are certainly not otherwise inferior to Wren's, greatly surpass them in the classical dignity which they derive from their porticos. It has indeed hitherto been the fashion—for it can be termed nothing better—wholly to overlook the portico of the last-mentioned edifice, and to decry it on account of the supposed absurdity of its steeple, notwithstanding that, in its outline and architectural expression, that campanile exhibits far greater beauty and propriety than any other we can produce; while the general bad taste displayed in the design of St. Martin's has escaped from reproach on account of its portico alone. How far the architect of the latter was really gifted with taste will be more correctly judged by examining his church of St. Mary-le-Strand by Somerset-House (1714-18). As to that of St. Clement's, the steeple of which was also by Gibbs, few will dissent from the opinion passed on it by Malton, who terms it 'a disgusting fabric.'

Besides churches, there are very few public buildings of this period that make much architectural pretension, at least very few now remaining. The former building of the Bank of England, begun in 1734, possessed little beauty or grandeur, though the wings afterwards added by Sir Robert Taylor gave it its present extent of façade. St. Bartholomew's Hospital, commenced by Gibbs in 1730, is a tolerably fair specimen of the average taste of design at that period, which being the case, it is rather surprising that the Mansion House (1739) should have been so severely censured, since, taken altogether, it certainly possesses an air of dignity, and something picturesque in its side elevations. Ironmongers' Hall, Fenchurch-street, begun a few years later (1748), is very far superior in external appearance to any other of the City companies' halls then erected. In the latter half of the century few public buildings were erected, yet among them were two of the noblest which the City even now possesses, namely, the Excise Office and Newgate. The merit of the latter has been universally admitted; the other, on the contrary, is scarcely ever mentioned, notwithstanding that, for imposing grandeur of mass, and greatness of manner combined with simplicity, it surpasses everything else in the metropolis; not so the front of Guildhall by Dance (1789), which is utterly unworthy of the handsome Gothic interior which it masks, being in a most mongrel and vulgarized style, without one single merit to compensate for its absurdities. The small and picturesque front of the adjoining Gothic chapel has now disappeared, it having been taken down some years ago to make room for a building comprising the Bankrupt Courts, &c., a most insipid and tasteless design. After the Excise Office and Newgate, Somerset House is almost the only public building which distinguishes the reign of George III.; for all that has been done in the present century may be considered as commencing with the Regency. The end of the last century was however marked by the erection of the East India House, more decidedly Greek than anything which had preceded it. Compared with what it has since been, architecture was then at a rather low ebb; for although one or two of the buildings above mentioned are noble works, they must be taken as exceptions to the meagre, insipid, and monotonous style which stamps this period, and which such erections as the Adelphi and Portland-place rather confirm than contradict. With the exception of St. Peter-le-Poor (1791) and St. Martin's Outwich (1796), not one church was built from the commencement of the reign of George III. to the Regency. The year 1809 is the date from which the metropolitan architecture of the present century may be said to begin. The two Grecian orders, Doric and Ionic, were for the first time adopted as the standard mode, and insulated columns took place of engaged ones and pilasters. From this time porticos became of as general as they were before of rare application. But in London architectural character has been made to depend too much on such features alone, and even in them the chief study has been bestowed on the columns themselves, nothing whatever of embellishment—not even so much as amounts to consistent finish of the order—being bestowed on their entablatures and pediments. This pseudo-classical style, consisting in merely copying to the letter certain details of antient architecture, has in more than one instance been carried to a most offensive extent; but perhaps the most preposterous of all was the original front of the College of Surgeons, consisting of an Ionic hexastyle attached to a front which, so far from having any architectural pretensions, was in the most vulgar and barbarous taste.

Both the Custom-house and Bethlehem Hospital exhibit in some degree the same perverseness and incongruity, while many other buildings, though more consistent, are nevertheless cold and monotonous, and display nothing more conspicuously than barrenness of invention. Now that the novelty attending Grecian architecture, on its first introduction among us, has passed away, we begin to be disagreeably sensible of this, and to perceive that little or nothing has been done to naturalize it, or to render it more pliable or more copious than we first found it. Such an avowedly facsimile application of Athenian architecture as St. Pancras was not only excusable but laudable; yet one such specimen of the kind is sufficient; especially when we find that nearly every succeeding one has fallen short of it in regard to finish of details and beauty of execution, though even in St. Pancras the entablature and pediment look chillingly naked in comparison with the columns and the doors within the portico, which latter are in the most exquisite style of decoration. The small façade of St. Mark's, in North Audley Street, forms a rather striking exception from the frigidity and commonplace of Grecian design when reduced to the mere imitation of antient columns. Another pleasing exception is afforded by the New Corn Exchange, Mark Lane, which manifests some happy originality. Of such porticos as that of the College of Physicians, the most that can be said is that they are respectable copies,upon a very respectable scale. That of the Post-office (an Ionic hexastyle) is imposing for its size and spaciousness, and is well arranged, owing to its partly receding within the building as well as projecting from it, and to having only a large centre door, with a lesser one on each side of it; yet all the rest is rather poor, nor is there much of the genuine expression of the style aimed at. The façade of the University College is a more original and finer composition, besides affording the only instance of a decastyle portico. In the front of the National Gallery the architect of the structure last-mentioned has been by no means so happy: taken by itself the octostyle portico and the ascents to it make a pleasing and rather striking composition, but the cornice is by far too plain and meagre for the rich Corinthian columns, while the dome is positively bad, and altogether different in feeling and character from every other part. In the number of their columns these two porticos (of the University College and National Gallery) exhibit some degree of novelty, but as yet nearly everything of the kind we possess is upon a uniform scale far inferior to that of some of the public buildings at Paris. The only exception, where unusual magnitude has been aimed at, is the Doric Propylæum or Railway Terminus, Euston Square. Here the order displays itself effectively, not only on account of its dimensions, but also because there are no windows nor other features of that kind to interfere with it. The British Fire Office, on the contrary, exhibits a most perverse application of a Grecian Doric to a building which in itself is in the most extravagant and fantastical taste.

Most of the new churches in London and the suburbs professing to be Greek are little better than parodies and travesties of the style. They exhibit moreover a wearisome repetition of the same stale hackneyed ideas, or rather the want of any idea beyond that of tacking a few columns to the front of what would else be mere meeting-houses. These and other spiritless as well as mongrel samples of the Anglo-Grecian school seem at length to have brought the style into disrepute, and accordingly some of the more recent buildings show a desire to return to the Italian, which, if purified and treated with originality instead of servile indiscriminate copying, would in most cases recommend itself in preference to the other. The Travellers' Club-house, particularly the garden front, is a charming and beautifully finished example of the Italian, and its architect (Mr. Barry) has since given a sort of combination of that and Grecian in the new façade of the College of Surgeons. Goldsmiths' Hall is Italian of a more heavily magnificent character, which however is greatly injured by the poverty of the ground-floor and its windows, which is left very bald, notwithstanding that it is comprised within the order Two buildings erected in 1838, the London and Westminster Bank, and the new synagogue, St. Helen's Place, belong also to the Italian school.

Here we must bring to a conclusion this general summary of the architecture of the metropolis, which it would have been a far easier task to expand than to confine to these limits. We have attempted nothing like either description or detailed criticism, the former of which at least is to be met with in a variety of works. The one more especially devoted to buildings and architecture is the new edition of 'Illustrations of the Public Buildings of London,' by W. H. Leeds. The article 'London,' in Moule's 'English Counties,' will also be found to contain a great deal of information; while in the volumes of the *Companion to the Almanac*, most of the edifices erected within the last six or seven years are described at some length. In regard to detailed criticism, the series of papers in the *Printing Machine*, entitled 'Strictures on Structures,' gives the New Palace, York Column, and various other subjects; and a similar series of architectural critiques on other metropolitan buildings has been commenced in the *Civil Engineer's Journal*.

Table of Public Buildings most worthy of Notice for their Architecture.

SEVENTEENTH CENTURY.

	Date.	Architect.	Remarks.
Whitehall Chapel . . .	1619	Inigo Jones	Chiefly admirable as the first specimen of pure Italian.
York Stairs	1626	Ditto	
St. Paul's, Covent Garden .	1631	Ditto	Tuscan, distyle in antis.
Temple Bar	1670-2	Sir C. Wren	
The Monument . . .	1671-7	Ditto	Fluted Doric column; total height, including pedestal, &c., 202 feet.
St. Stephen's, Walbrook .	1672-9	Ditto	Exterior concealed by houses; interior over-pra chiefly remarkable for its dome.
St. Paul's Cathedral, begun .	1675	Ditto	Extreme length, 500 feet; height to top of cross,

Eighteenth Century.

	Date.	Architect.	Remarks.
St. Paul's finished, . .	1710		Style Italo-Roman; exterior both magnificent and p turesque, though not faultless.
St. George's, Hanover-square	f. 1724	J. James	Portico hexastyle, Corinthian.
St. Martin's . . .	1721-6	J. Gibbs	Portico hexastyle, Corinthian; the general style bad.
St. George's, Bloomsbury .	f. 1731	Hawksmoor	Ditto, ditto; Campanile excellent.
Mansion House . . .	1739-53	Dance	
Westminster Bridge . .	1739-50	Labelye	Length 1066 feet.
Ironmongers' Hall . .	1748	Holden	Italian Ionic on basement.
Horse Guards . . .	1751	W. Kent	
Blackfriars Bridge . .	1760-70	R. Mylne	Length 1000 feet.
Excise Office . . .	1769	James Gandon	Plain in design, but of most commanding aspect.
Adelphi	1770	Adams	
Newgate	1770-82	Dance	Admirable in design and character. [front 590 fe
Somerset House . .	1776	Sir W. Chambers	Though poor in parts, a good example of Italian. Ri
Clerkenwell Sessions House .	1780	Rogers	East front handsome.
Bank	1789-826	Sir J. Soane	Very picturesque in parts.
India House . . .	1799	R. Jupp	Hexastyle loggia, Grecian Ionic; sculptured frieze a pediment.

Nineteenth Century.

Covent-Garden Theatre .	1808-9	Sir R. Smirke	Grecian Doric; tetrastyle portico.
Drury-Lane Theatre . .	1811-12	B. Wyatt	
Opera-house, altered . .	1818	Nash and Repton	
Bethlehem Hospital . .	1812-15	J. Lewis	Portico hexastyle, Ionic. Length 569 feet.
Waterloo Bridge . . .	1811	J. Rennie	Length 1326 feet.
Mint	1811	Sir R. Smirke	Grecian Doric on a basement.
Custom House . . .	1813	D. Laing	The Long Room and centre of the river front qui altered after the accident in 1826. Length 484 feet.
London Institution . .	1815-19	W. Brooks	
St. Pancras Church . .	1819-22	W. & H. W. Inwood	The finest copy of Athenian Ionic.
Post-Office . . .	1823-9	Sir R. Smirke	Hexastyle, Ionic portico; extent of front 390 feet.
Hanover Chapel, Regent-street	1823-5	R. C. Cockerell	Tetrastyle Ionic portico.
British Museum (new buildings)		Sir R. Smirke	
Buckingham Palace . .	1825	Nash and Blore	
College of Physicians and Union Club-House . . .	1825-7	Sir R. Smirke	Grecian Ionic
Board of Trade . . .	1824-6	Sir J. Soane	Roman Corinthian.
Colosseum	1824	D. Burton	Hexastyle, Grecian Doric portico attached to a polyg 130 feet diameter.
London Bridge . . .	1825-31	J. Rennie	Length 920 feet.
St. Mark's, North Audley-st. .	1825-8	Gandy-Deering	Florid Grecian Ionic; façade small, but of rich design.
St. Katherine's Hospital .	1826	Poynter	Chapel Gothic; the rest Old English Domestic.
Hall, Christ Church Hospital .	1826	J. Shaw	Later Gothic.
Scotch Church, Regent-square	1827-8	W. Tite	Gothic.
St. George's Hospital . .	1827	W. Wilkins	Portico tetrastyle, with square pillars.
London University . .	1827-9	Ditto	Façade not completed; decastyle portico, and dome.
New Corn Exchange . .	1827-8	G. Smith	Grecian Doric, with pleasing originality of design.
St. Paul's School . . .	1827	G. Smith	Hexastyle, Tivoli Corinthian on a basement.
Law Institution, Chancery-lane	1827-9	L. Vulliamy	Grecian Ionic hexastyle.
Archway, Green Park . .	1828	D. Burton	
Fishmongers' Hall . .	1827-34	H. Roberts	Grecian Ionic.
Athenæum Club . . .	1829	D. Burton	Its bas-relief frieze the only specimen in London.
Goldsmiths' Hall . . .	1829-35	P. Hardwick	Italian; magnificent, yet somewhat heavy, and bas
Exeter Hall . . .	1830-1	Gandy-Deering	Greco-Corinthian, distyle in antis. [ment poc
St. Dunstan's in the West .	1830-32	J. Shaw	Gothic; handsome Louvre tower.
York Column . . .	1830-36	B. Wyatt	Total height, including statue, 137 ft. 9 in.
Lowther Arcade . . .	1830	J. Turner	Greco-Italian, with pendentive domes.
Hungerford Market . .	1831-3	C. Fowler	
Travellers' Club . . .	1831	C. Barry	Choice specimen of the best Italian style, particularly tl design of garden front.
Charing-Cross Hospital .	1830-1	D. Burton	
St. George's, Woburn-square .	1832	L. Vulliamy	Gothic; handsome spire.
Westminster Hospital . .	1832	Inwoods	Modernized Gothic.
National Gallery . . .	1832-7	W. Wilkins	Grecian; total extent of front 458 feet.
State-Paper Office, St. James's Park	1833	Sir J. Soane	One of his chastest productions. Style, Italian.
Pantheon Bazaar . .	1834	S. Smirke	
School for Indigent Blind .	1834-7	J. Newman	Style Tudor, white brick and stone; central tower of ric design.
St. Olave's School . . .	1835	J. Field	Style Elizabethan, red brick and stone.
College of Surgeons . .	1835-6	C. Barry	Italianized Grecian.
United University Club .	1836-7	Sir R. & S. Smirke	Style a modified Italian; bas-relief panels.
St. James's Theatre . .	1836	S. Beazley	
Railway Terminus, Euston-sq.	1837-8	P. Hardwick	A Grecian Doric propylæum on an imposing scale.
London and Westminster Bank	1837-8	Cockerell and Tite	Style modified Italian; singular but pleasing.
Synagogue, Great St. Helen's	1837-8	J. Davies	Style Italian; interior rich and tasteful.
Reform Club . . .	1838	C. Barry	Italian.

sions.—The City of London is divided, for ecclesiasti-
ects and for the management of the poor, into 98
s within the walls, and 11 without the walls. For
pal purposes the City is divided into 26 wards, each
h is in some respects a separate community. The
an and common-councilmen, who are chosen to re-
t the ward (as hereafter explained) in the City parlia-
orm likewise a ward council, and they have the control
y of its local affairs. In most of the wards there are
sions into precincts, chiefly for the purposes of elec-
The division into wards appears to have been made
t regard to the parochial divisions, as the different
onsist of divisions of parishes as often as they are
ninous with them. An inquest jury is chosen annu-
each ward, whose office it is to make presentments
sances and returns of non-freemen, and to perform
her duties as are within the province of a leet jury.
comparative wealth and importance of each of the
ls may be estimated from the following statement of
ount of rental assessed in each for local purposes in
801, 1831, and 1838 respectively:—

WARDS.	Amount of Rental.			
	1771.	1801.	1831.	1838.
	£.	£.	£.	£.
gate, Within and Without	16,001	17,827	28,860	33,297
te	21,082	26,467	40,044	42,529
haw	4,858	3,796	6,740	6,819
gsgate	16,465	14,568	19,760	20,776
psgate, Within and Without	34,472	37,041	63,988	66,809
Street	10,041	11,788	17,842	19,154
	10,230	10,179	15,847	19,036
Street	27,982	31,835	47,408	31,903
ewick	8,444	8,424	11,958	15,067
Baynard	15,858	19,807	30,114	38,311
	16,410	18,994	23,488	27,733
an Street	14,282	13,951	34,043	34,785
ainers	8,847	9,288	11,729	11,503
ill	12,167	11,811	23,529	6,551
legate Within	16,800	17,284	29,099	33,308
legate Without	18,378	21,834	30,617	35,691
ate	10,144	12,156	13,938	14,897
gdon Within	28,172	35,573	57,551	55,794
gdon Without	72,702	77,368	115,013	103,614
ourn	23,668	25,405	38,639	40,356
Street	8,128	6,976	12,446	12,750
ken	19,051	18,297	34,897	33,060
hithe	8,182	8,982	13,824	13,709
	17,480	27,807	41,200	37,437
	8,546	9,342	15,042	14,480
ook	9,301	11,072	15,298	17,421
Total	457,701	507,372	792,904	786,790

corporation of London consists of the whole body of
izens or freemen, under the style of 'Mayor, Com-
y, and Citizens,' viz.:—

-mayor	1	
rmen, in addition to the Lord-mayor	25	
mon-councilmen	240	
		266

Officers of the Corporation.

Sheriffs, who are jointly sheriff of Middlesex.
order.
n-clerk.
mon-sergeant.
ge of the Sheriffs' Court and Assistant Judge of the
entral Criminal Court.
four Common Pleaders.
two Secondaries.
two Under-sheriffs.
ptroller of the Chamber.
embrancer.
itor and Clerk Comptroller of the Bridge House.
ner for London and Southwark.
k of the Peace.
iff of Southwark.
four Attorneys of the Mayor's Court.
four Auditors of the City and Bridge House Accounts.
k of the Chamber.
two Bridge-masters or Wardens.
three Esquires, and other officers of the lord-mayor's
usehold.
four Harbour-masters, and other officers connected
th the port of London and mooring-chain services.
Clerks and Assistant Clerks to the lord-mayor and
ting magistrates in London and Southwark.
The Keepers, Ordinary and Chaplains, and Surgeons of the several Prisons of the city.
The Superintendant of Police, the City Marshals, and other officers connected with the police of the city, and sundry officers employed in the civil government of the corporation, collection of its revenue, the markets, &c.

The lord-mayor is elected on the 29th September in each year, from among those aldermen who have served the office of sheriff. Two such aldermen are nominated by the liverymen in common-hall, and of those two, one is selected, usually the senior alderman, by the court of aldermen. He enters upon the duties of his office on the 9th November following: if he refuses to serve, he must pay a fine of a 1000*l.* The lord-mayor elect must be presented to the lord chancellor, who signifies the assent of the crown to his election. He must also be presented, on the day on which he enters on his office, to the barons of the exchequer, when he takes the oath of office. The salary and allowances paid to him from the city funds during his year of office amount to 6422*l.* 8*s.* 4*d.*, in addition to which he receives sums from various sources which raise the official income to about 7900*l.* The expenses, chiefly arising from a sumptuous hospitality, usually exceed the income by about 4000*l.* He resides during the year of office in the Mansion-house, which is handsomely furnished, and provided with plate and jewelled ornaments said to be worth from 20,000*l.* to 30,000*l.* The functions of the lord-mayor are multifarious. A great part of his time is occupied by magisterial duties. He presides over the courts of aldermen, common-council, and common-hall. He is conservator of the Thames, and holds eight courts during the year of office, two for each of the counties of Middlesex, Surrey, Essex, and Kent, 'to enquire into all offences to the destruction of the fish, nuisances upon and impediments of the common passage of the Thames and Medway.' He presides as judge in the Court of Hustings, the supreme court of record in London, which court is generally held once a week, whence it is frequently resorted to for obtaining judgments in cases (as of outlawry) where expedition is required. He is first commissioner of the Central Criminal Court, and usually opens the sessions in person. He is a justice of gaol delivery for Newgate, and is named in every commission for that purpose. He usually opens the London session in person. He also opens and presides at the sessions in Southwark. He is escheator in London and Southwark. He is also admiral of the port of London, and is at the head of the lieutenancy of the city of London. He is properly clerk of the markets and gauger for the city. On the demise of the crown he is always summoned to attend the privy-council which declares allegiance to the successor. At the coronation, the lord-mayor acts as chief butler, and receives for his fee a gold cup.

The aldermen are elected for life, at meetings of the ward, called a wardmote, which must take place within 14 days after each vacancy shall occur. The electors are such householders of the ward as are freemen of the city and pay local taxes to the amount of 30*s.* per annum. A person refusing to serve the office when elected may be fined 500*l.*, but is excused on swearing that he is not worth 30,000*l.* With the exception of the alderman of the Ward of the Bridge (always the senior alderman, and who has no local duties to perform), every alderman appoints a deputy from among the common-councilmen of the ward. Every alderman is a justice of the peace for the city of London, and one of them attends, by a rotation among the body, for a week at one time in the justice-room at the Guildhall, for the transaction of magisterial business. In cases where two magistrates are required to determine any case at the Mansion-house, this sitting alderman proceeds there, and joins the lord-mayor for the purpose.

The common-councilmen are elected annually on St. Thomas's day, at a wardmote, the electors being the same as in the elections of aldermen. The number elected varies in the different wards, but not in proportion to their extent and presumed importance, the smallest number in any ward being 4, and the greatest 17. Any qualified freeman householder, when elected, would be subject to fine and disfranchisement for not serving, but such cases seldom or never occur. The common-councilmen do not meet in any court exclusively their own, their sittings being always under the presidence of the lord-mayor and attended of right by the aldermen. The title of the court of common-council is 'the Lord Mayor

Aldermen, and Commons of the city of London in Common Council assembled.' To constitute a court there must be present the lord-mayor or some alderman, his locum tenens, two other aldermen at least, and as many common councilmen as, with the lord-mayor and aldermen present, shall make up the number of 40. The senior law-officers of the city have seats in the court, but have no vote, and do not speak unless called upon to do so. Of late years the public have been allowed to attend, but must be excluded upon the motion of any member of the court. There are usually about 12 ordinary meetings of the court in the year. The lord-mayor may at any time call the members together, and on a requisition from a moderate number of members he seldom fails to do so. This court has now unlimited power of applying the funds of the corporation, and full legislative authority in all municipal matters, where not restrained by statute. The members of the court are severally nominated members of various committees, and thus perform various executive functions. The common seal of the city cannot be applied to any instrument but by order of the court of common-council, which thus reserves power over the disposition of the landed property belonging to the corporation.

The two sheriffs are chosen annually by such of the freemen as are liverymen of some one of the city companies. Every alderman who has not served the office is put in nomination as a matter of course. The lord-mayor, between the 1st of April and the 14th June, may put in nomination any number of freemen not exceeding nine. Any person thus nominated remains on the list until he is elected or has paid the fine of 400*l.* and 20 marks for not serving the office; and on the day of election, Midsummer-day, any two electors may put any freeman in nomination. No person is liable to serve the office twice.

The sheriffs attend the lord-mayor on state occasions and at every court of aldermen. They present the petitions of the court of aldermen or common-council to the House of Commons at the bar of the House. In the cases of addresses to the crown they attend at court for the purpose of learning when the address will be received. They attend the common-hall at elections to take the votes. They are the returning officers of the members of the House of Commons for the city of London and the county of Middlesex. Either the sheriffs or the under-sheriff of Middlesex attend at the execution of capital sentences within the city. They have the superintendence of prisons within the city, and present reports concerning their state at every court of aldermen. The sheriffs receive between them a payment from the city of 737*l.* 6*s.* 8*d.*, and they have a few incidental emoluments which one year with another raise the income to 1000*l.* for the two. On the other hand, the state which they are expected to maintain and the entertainment of the judges and aldermen who attend the Central Criminal Court at the Old Bailey subject them to very heavy expenses, amounting for each sheriff to about 2000*l.* beyond the receipts. The shrievalty being vested in the citizens of London, some of its most important duties are assigned to the judge of the sheriffs' court, and the secondaries, who are elected by the common-council.

The recorder is elected for life by the court of aldermen. He must be a freeman, but the grant of freedom may immediately precede the election. The recorder has always been chosen from among barristers. The duties of recorder are those of an advocate and adviser of the corporation. He is advised with on all cases relating to the affairs of the city, and holds a brief for the corporation in all cases, except in the courts where he himself presides. When the city is heard by council before either House of Parliament, the recorder argues the case. He is by charter a justice of the peace and commissioner of the Central Criminal Court, and a justice of the peace in Southwark. The recorder attends the lord-mayor on all important occasions of state ceremony. He sits with the judges of the court of hustings to direct them in points of law and to give judgment. The recorder acts as one of the judges at the twelve sessions holden annually in the Old Bailey, and at the conclusion of each prepares a report of the case of every capital convict for the consideration of the privy-council, and he afterwards attends to take the pleasure of the Queen thereupon. He issues warrants for the reprieve or execution of the criminals whose cases have been reported. The annual salary of the recorder is 3000*l.*, in addition to which he receives the ordinary fees on all cases and briefs which come to him from the corporation, and some other trifling emoluments.

The common-sergeant, who has always been a barrister, is elected by the common-council on the nomination of some member of the court. His duties are:—to preside daily in one of the courts of the Old Bailey during the sessions for London and Middlesex, for which purpose he is always named in the commission; he attends all meetings of the livery in common-hall; he attends all courts of aldermen and of common-council unless otherwise engaged in behalf of the corporation; he also attends the lord-mayor on all public occasions; he advises in all law cases relating to the corporation, and acts as counsel for the city in the courts in Westminster Hall. His salary is 1500*l.* per annum, in addition to which he receives fees with all cases and briefs sent to him on behalf of the city, and has some other small emoluments.

The town-clerk is appointed by the common-council, and holds his office by a grant under the common-seal during the pleasure of the court. He is the clerk of all courts holden before the lord-mayor and aldermen; of the mayor's court, of the court of hustings, of the courts of common-council and of common-hall, and of the sessions for conservation of the waters of the Thames and Medway. His duties are exceedingly various; they are such as are incident to the office of a secretary or town-clerk of a corporation, and need not be here detailed. In one year (1833) this officer attended 75 committees of aldermen and 502 committees of the common-council, in addition to his other duties. His emoluments consist of fees on licences, on leases, and on admissions to freedom or to different offices, estimated at 700*l.* per annum for himself, and 100*l.* for his clerks: besides these fees he has a salary of 1300*l* per annum,, and an allowance of 1500*l.* per annum for the expenses of his office. He resides in apartments at the Guildhall, free of rent and taxes.

It is not necessary to enter upon any detail of the nature of other offices held under the corporation. Their duties will generally be sufficiently indicated by their designations.

In the City of London there are 89 companies or guilds, eight of which are practically extinct; and one other, that of parish clerks, is not connected with the municipal institutions of the city. Except in cases where the honorary freedom of the City is presented by a formal vote of the corporation, no person could, until recently, become a freeman who had not been admitted into one of these companies; but when by birth, apprenticeship, purchase, or gift, a person has become a member of a company, he has (by virtue of an existing bye-law) an inchoate right to the freedom of the corporation, and is admitted on proving his qualification and on payment of certain fees. Within the last few years however the antient practice has been resumed of admitting to the freedom all resident householders who may apply, by vote of common-council, without being members of any company. Most of the companies possess what is called a livery, that is, a part of their body, under the name of liverymen, if they be freemen of the corporation, enjoy privileges which other freemen do not possess: such as voting for mayor, sheriffs, chamberlain, &c., a right limited to them exclusively by an act of Geo. II. The following list exhibits the names of the companies, stated in their order of precedence. The first twelve are called the Twelve Great Companies. The names in Italics are those of extinct companies:—

1. Mercers
2. Grocers
3 Drapers
4. Fishmongers
5. Goldsmiths
6. Skinners
7. Merchant Tailors
8. Haberdashers
9. Salters
10. Ironmongers
11. Vintners
12. Cloth-workers
13. Dyers
14. Brewers
15. Leather-sellers
16. Pewterers
17. Barbers
18. Cutlers
19. Bakers
20. Wax-chandlers
21. Tallow-chandlers
22. Armourers and Braziers
23. Girdlers
24. Butchers
25. Saddlers
26. Carpenters
27. Cordwainers
28. Painter-stainers
29. Curriers
30. Masons
31. Plumbers
32. Innholders
33. Founders
34. Poulterers
35. Cooks
36. Coopers
37. Bricklayers
38. Bowyers
39. Fletchers
40. Blacksmiths

1. Joiners
2. Weavers
3. Woolmen
4. Scriveners
5. Fruiterers
6. Plasterers
7. Stationers
8. Broderers
9. Upholders
0. Musicians
1. Turners
2. Basket-makers
3. Glaziers
4. Horners
5. Farriers
6. Paviers
7. Loriners
8. Apothecaries
9. Shipwrights
0. Spectacle-makers
1. Clock-makers
2. Glovers
3. Comb-makers
4. Felt-makers
5 Frame-work knitters
66. Silk-throwers
67. *Silkmen*
68. *Pin-makers*
69. Needle-makers
70. Gardeners
71. *Soap-makers*
72. Tin-plate workers
73. Wheelwrights
74. Distillers
75. *Hat-band-makers*
76. Patten-makers
77. Glass-sellers
78. Tobacco-pipe-makers
79. Coach and harness makers
80. Gun-makers
81. Wire-drawers
82. *Long bowstring-makers*
83. Playing-card-makers
84. Fan-makers
85. *Woodmongers*
86. *Starch-makers*
87. *Fishermen*
88. Parish Clerks
89. Carmen

No company on the foregoing list, with the exception of ne Carmen, is now exclusively composed of persons from hom it takes its name. The greater part of the Apothearies' company are in some way connected with the sale of rugs or the practice of medicine; and the greater part of he Stationers' company in the trade connected with the ale of books. The livery was in former times granted nly to the more wealthy citizens. An order of the ourt of aldermen, passed in 1697, directs that 'no person hould be allowed to take upon himself the clothing r livery) of any of the twelve companies,' those which tand at the head of the foregoing list, 'unless he have n estate of 1000*l.*; nor of the inferior companies unless e have an estate of 500*l.*' In more modern times not nly has this restriction been relaxed, but it has frequently een made imperative upon many freemen of the City to ake up their livery in one of the companies. The terms f admission vary with regard to different companies; but, ith some few exceptions, it is open to any freeman to take p the livery of any company upon payment of its regular ees or fines. When the freedom is claimed on the ground f patrimony or servitude, the fines are usually limited to a ew pounds; in other cases they vary from a few pounds to 00 guineas. These trading companies may be divided into hree classes:—

1. Those which exercise an efficient control over their rade, in which class there are now only two companies, the oldsmiths and the Apothecaries.

2. Those which have power to search for defective wares, r to prove or mark the article, or to execute any legislative nactment passed for regulating the trade. In this class here are now only the Apothecaries, Stationers, Gunmakers, and Founders, which last has the privilege of testing and marking weights.

3. Those into which persons carrying on certain occupations in the City are compelled to enter, which class includes all not enumerated in the first and second class.

The management of the affairs of these companies is entrusted to certain senior members of the livery, who form what is commonly called 'The Court of Assistants,' and which usually consists of a master, a senior warden, a junior warden, and of an indefinite number of assistants, who succeed in due rotation to the higher offices of the court. Many of the companies possess extensive estates and other property, which is applied in part to the relief of decayed members of their own body and their families, and in part to more general objects of charity. Many of them are also trustees of lands and money, which have been appropriated by the donors to specific charitable objects, and, among such objects, to education. These companies are however no part of the corporation of London, but have many of them their own charters of incorporation.

The City returns four members to the House of Commons. The right of election is in the freemen, being liverymen, and the inhabitant householders occupying dwellings of 10*l.* yearly value. The numbers of electors registered in these two classes in 1836 and 1837 were as follows:—

	1836.	1837.
Number of householders . .	10,322	10,673
Freemen, being liverymen . .	9,134	9,005
Together . .	19,456	19,678

It is probable that some of the above are registered in their double capacity, and thus swell the apparent number of electors. The number that polled at the general election (on which occasion the same individual can appear in one character only) of 1837, which was severely contested, was—

Householders	5,799
Fremeen, being liverymen . .	5,778
	11,577

Production.—That London is not commonly considered as a manufacturing town is owing to the more important aspects under which it presents itself, and not because of the absence of manufacturing industry. Manufactures of almost every kind are in fact carried on in the metropolis, and upon a scale of great magnitude; the best workmen in almost every branch of handicraft being certain of finding employment in London at the highest rate of wages. London was for a long time the only seat of the English broad silk manufacture, which is still carried on as extensively as formerly, and perhaps to a greater extent than ever, although Manchester, Macclesfield, and other towns have now become rivals in that branch of industry. Linen, woollen, and cotton fabrics are not made in or about London.

The largest breweries, distilleries, and sugar-refineries in the kingdom are in the metropolis. The manufacture of metals in almost every branch is carried on to a vast extent. It is true that a great part of the hardware and cutlery required for common purposes is made at Birmingham and Sheffield, which likewise supply the greater part of those articles required for exportation, because of the lower prices at which they can be there produced; but when taste or fashion is to be considered, and superiority of quality is desired, the London workmen are commonly employed. Almost every kind of machinery, from the smallest wheels required by the watch-maker to the most powerful steam-engines, are made in London. The making of gold and silver articles, of optical and surgical and other instruments, tools of the best quality, and musical instruments, gives employment to numerous hands. Ship-building, with all its accessaries, rope-makers, mast-makers, block-makers, anchor-smiths, &c., has always been actively prosecuted. There are also numerous chemical works on a large scale, tanneries, soap-manufactories, potteries, and dye-houses. Male and female clothing of all descriptions is made, not merely for the use of the inhabitants of the metropolis, but for the supply of wealthy persons in various parts of the kingdom, and even in the British colonies. The metropolis is also the great workshop of literature, science, and the arts. The number of books printed and published in all other parts of England is small in comparison with what is produced in London. The number of men employed as compositors in London is estimated at 2000; there are also 500 apprentices, and 1000 pressmen, in addition to those who superintend the working of the great printing-machines, and whose number has not been ascertained. In the extent to which it has now reached, the mechanical part of the labour of producing books and periodical publications in London may well be considered a manufacture. It has been computed by a bookseller long conversant with one great branch of publication—that of periodical works—that the number of such works sold on the last day of every month in London amounts to half a million of copies, occasioning an expenditure on the part of the public of 25,000*l.*; and that the number of parcels containing periodicals despatched into the country in various directions on that day is 2000. This estimate does not include weekly publications (not newspapers), about fifty in number, of which about ten millions of copies are sold in the course of the year. Of newspapers there are eleven published daily, six in the morning and five in the evening. There are besides twenty-four weekly newspapers, and thirty-eight which appear at other intervals of time, some three times and some twice a week; others on alternate weeks, and one or two monthly. The number of newspaper stamps issued for London publications between 15th September, 1835, and 15th March, 1838, was—

In the year ending 15th of September,	1836 .	19,241,640
„ 15th „	1837 .	29,172,797
six months ending 15th March,	1838 .	14,438,556

The number of newspapers despatched from the General Post-Office in London in each of the three years ending 31st of October, 1835-6-7, was as follows:—

	Year ending 31st October,		
	1835.	1836.	1837.
Sent from the Inland Office .	14,066,406	12,913,878	19,046,411
„ Foreign-Office .	158,929	231,819	427,516
„ Ship-Letter Office	55,555	66,158	87,537
	14,280,890	13,211,855	19,561,464
Sent through the Twopenny-Post	234,756	242,630	367,942
Total .	14,515,646	13,454,485	19,929,406

The increase in the number of stamps and in the transmission by post during the last year above given, doubtless arises from the reduction of the stamp-duty to which newspapers were liable.

Consumption.—It is not possible to state with any pretensions to accuracy the amount of consumption in London, of any except a very few articles of general use. A considerable part of the foreign and colonial merchandise that passes every year through the custom-house of the port is forwarded into the interior of the country, and the same remark applies, though in a less degree, to the produce of London breweries, distilleries, tanneries, &c. A tolerably good test of the consumption of butchers' meat was formerly supplied by the returns of sheep and cattle sold in Smithfield market, although this would at all times be somewhat below the actual amount, because of the number of animals sold to butchers by the drovers on their road to the market; but of late years, since the improvement of turnpike-roads, and the consequent acceleration of travelling, and more especially since the adoption of steam-navigation, a great and continually increasing quantity of cattle and slaughtered meat is brought for sale to London, of which no account is taken. During all the colder months of the year, from October to April, almost every steam-vessel employed in the coasting-trade to London brings a supply to its markets. Oxen, sheep, and swine slaughtered on Saturday in Edinburgh are by this means brought and exposed to sale on the following Monday, and this branch of business is now followed with activity and regularity from almost every port of the kingdom within 500 miles of the metropolis, which has with it a constant steam communication. Live cattle, sheep, and pigs are brought by the same means during the summer months, and in considerable numbers. With this explanation the following table is offered, showing the average number of sheep and cattle sold in Smithfield market in each quinquennial period from 1730 to 1770, and the actual numbers so sold in each of the years from 1820 to 1838:—

		Sheep.	Cattle.
1730	to 1735	568,060	93,655
1735	1740	599,466	97,548
1740	1745	531,134	85,892
1745	1750	655,516	80,876
1750	1755	680,618	80,843
1755	1760	616,750	91,699
1760	1765	635,247	86,555
1765	1770	632,812	84,244

	Sheep.	Cattle.
1820	947,990	132,933
1821	1,107,230	129,125
1822	1,340,160	142,043
1823	1,264,920	149,552
1824	1,239,720	163,615
1825	1,130,310	156,985
1826	1,270,530	143,460
1827	1,335,100	138,363
1828	1,288,460	147,968
1829	1,240,300	158,313
1830	1,287,070	159,907
1831	1,189,010	148,168
1832	1,257,180	158,640
1833	1,167,820	152,093
1834	1,237,360	162,485
1835	1,381,540	170,325
1836	1,219,510	164,351
1837	1,329,010	172,435
1838	1,403,400	183,362

The following statement of the quantity of wheat and flour brought into the port of London in each year from 1820 to 1838 contains the only information that can be given concerning the consumption of bread in the metropolis, but must not be taken as an accurate test of that fact. In ordinary seasons the great bulk of these importations are retained for the use of the metropolis and surrounding district, but in addition to the quantities thus recorded a great deal of flour is brought by land-carriage from the adjoining counties which does not pass through the books of the custom-house, nor of the clerks of the markets; and on the other hand, in seasons of scarcity, when grain is brought from abroad, much that figures in the returns of the port is afterwards transmitted to other parts of the country. In order to render the following figures as useful as possible in a comparative point of view, notice is added characteristic of each season.

Year ending Michaelmas.	Wheat. Quarters.	Flour. Sacks and Barrels.	Nature of Harvest.
1821	641,371	464.820	Average.
1822	486,484	442,218	
1823	554,351	450,095	Below an average.
1824	394,637	502,390	Average.
1825	354,267	457,231	Not quite an average.
1826	530,961	540,253	Average.
1827	447,677	482,266	
1828	409,042	450,689	Below an average.
1829	423,102	468,293	Average.
1830	1,342,745	484,793	Average.
1831	873,488	475,746	Not quite an average.
1832	908,517	627,003	Full average.
1833	695,902	542,813	
1834	459,222	409,565	
1835	457,448	442,152	Above an average.
1836	429,748	376,775	
1837	465,362	428,481	Below an average.
1838	525,407	515,005	

The following statement of the quantity of coals brought to London in each year, from 1825, will show the consumption of that article with tolerable accuracy. Of late years the greater amount of gas-lighting, the increasing number of steam-engines employed for manufacturing purposes, and still more the supplying of steam-vessels, occasion an increased consumption beyond the quantity used in families; but these circumstances cannot very materially affect the general result.

	Tons.		Tons.
1825	1,856,606	1832	2,139,078
1826	2,040,291	1833	2,010,409
1827	1,882,321	1834	2,078,685
1828	1,960,559	1835	2,298,812
1829	2,018,975	1836	2,398,352
1830	2,079,275	1837	2,626,997
1831	2,045,292	1838	2,581,085

The consumption of coals in London, in 1744, was 596,192 tons, and in 1795 had reached 1,163,100 tons.

The inhabitants of London draw nearly the whole of their supply of water, for manufacturing and household purposes, from the Thames and what is called the New River. [HERTFORDSHIRE, p. 179.] The daily consumption is stated by the directors of the principal companies (eight in number) by which it is distributed, to amount to 20,829,555 imperial gallons. Of this quantity, the north-western district receives 9,000,727 gallons, the north-eastern 7,694,828 gallons, and the district on the south side of the Thames 4,134,000 gallons. The inhabitants of the northern suburb are partly supplied by a ninth company, from ponds at Hampstead and Highgate. The six companies which draw their supply from the Thames have large reservoirs, into which the water is pumped by powerful engines, and allowed to remain sufficiently long for the subsidence of the grosser impurities. Besides these sources of supply, London has the advantage of possessing, in many parts, springs of peculiarly fine water; and there is little doubt that the comparative state of healthiness enjoyed by the inhabitants must be in a great measure attributed to the abundant supply of water and the excellent drainage.

The consumption of the metropolis, in regard to some principal articles which are under the management of the excise, may be stated with tolerable accuracy. The following statement gives the number of bushels of malt used by the London brewers, and the quantities of British and foreign spirits, tobacco, and snuff, which have been sent out with permits by the dealers or manufacturers, for consumption, in different years since 1827:—

		Sent out of Stock for Consumption.			
Years.	Malt used in Brewing. Bushels.	Foreign Spirits. Gallons.	British Spirits. Gallons.	Tobacco. lbs.	Snuff. lbs.
1827	3,964,649	1,512,268	4,602,376	3,167,503	895,009
1830	3,176,046	1,485,953	5,222,145	3,359,273	818,946
1833	4,653,526	1,471,267	5,218,818	3,384,744	1,107,660
1835	5,284,826	1,420,600	5,941,351	4,038,317	1,096,492
1837	5,692,360	1,270,931	5,354,388	3,636,362	1,181,723

Some abatement from the above quantities, but in what roportion cannot be stated, must be made before we can scertain the actual consumption of the metropolis, because any persons who reside beyond its limits procure supplies om London tradesmen.

Police.—Until comparatively a recent period, the police this metropolis was very defective, although the subject ad engaged the attention of the public, and had been in- stigated by numerous committees of the House of Com- ons at various times during the last fifty years. The 'Trea- se on the Police of the Metropolis,' published by Mr. Col- uhoun in1797, revealed such dreadful scenes of depravity as werfully engaged the public attention; and to that work ay in a great measure be attributed the reforms which ave at length been introduced. Deplorable as was the state the police when Mr. Colquhoun's work was published, it as not worse than it had been for some centuries. As cently as the beginning of the eighteenth century it was ighly dangerous to venture abroad, alone and unarmed, ter dark, except in the most frequented parts of the town; nd in 1728 a plan was formed for robbing the queen in St. aul's Churchyard, as she returned from supper in the city St. James's; but the gang being engaged in robbing Sir ilbert Heathcote, an alderman, on his return from the ouse of Commons, her majesty passed unmolested. Many cts are recorded by Maitland and other historians, showing e height to which open violence was carried in those days. ielding, writing in 1751, says: 'The great increase of rob- eries within these few years is an evil which to me appears deserve some attention. In fact, I make no doubt but at the streets of this town, and the roads leading to it, ill shortly be impassable without the utmost hazard; nor re we threatened with seeing less dangerous gangs of ogues among us than those which the Italians call the anditti. What indeed may not the public apprehend hen they are informed, as an unquestionable fact, that here are at this time a great gang of rogues, whose number alls little short of a hundred, who are incorporated in one ody, have officers and a treasury, and have reduced theft nd robbery into a regular system? There are of this society en who appear in all disguises and mix in most com- anies.' Even so recently as the end of the last century here were many places in the metropolis where swarms of he most desperate men openly congregated, in perfect ecurity from the police, which dared not disturb them. mong these places of resort were some, the names of which ave been handed down to us as infamous for the crimes hich were perpetrated in them. Open violence is now rtunately at an end, and even in the most lonely parts of he suburbs an efficient police ensures personal safety at all ours of the night. The vice which still exists is of a less btrusive character, and crimes are now for the most part onfined to depredations on property. Society has been hus tending towards improvement during the last forty or fty years, but it is during the latter half of this period hat the amendment has been most apparent. The evidence iven before a committee of the House of Commons, in 816, still detailed scenes and circumstances of villainy hich are no longer to be witnessed. The establishment f the metropolitan police force, under an act of parliament 1829, has been mainly instrumental in producing this provement. The regulations for its management are lculated for the prevention rather than the punishment crime, it having been among the gravest charges made gainst the system which it superseded that men were ursed in crime until the length to which they proceeded roduced the offer of rewards for their apprehension.

The police force is under the management of two commis- oners, who are in direct communication with the secretary state for the home department; under the commissioners re 17 superintendents, 70 inspectors, 342 sergeants, and 2968 onstables. The district under their care extends from rentford Bridge on the west, to the river Lea on the east, nd from Highgate on the north, to Streatham and Nor- ood on the south, excluding the city of London. The opulation of this district, at the census of 1831, was ,493,012 souls, and the rental of houses assessed for the elief of the poor within the same, in 1837, amounted to ,177,113*l.* per annum. The constables and officers must e men of good character, who can read and write, and who t the time of their appointment are not more than thirty- ive years of age. They wear a uniform dress, and are ltogether a fine and respectable-looking body of men. The whole district is parcelled out into seventeen divisions, to each of which one superintendent and an adequate number of sergeants and constables are appointed; and it is expected that each constable will exert himself to acquire a complete personal knowledge of his district. The system of responsibility throughout the force is perfect. The commissioners are answerable to the government for the due performance of their duties; the superintendents are answerable to the commissioners for their own conduct, and that of the sergeants and constables in their division; and the sergeants are answerable to the superintendents for the good conduct of the constables under their orders. The constables and officers are strictly forbidden to receive any payments or gratuities from private persons. The expense attending this system is greater than that of the old nightly watch, for which it was substituted. The total expenditure, in the year 1837, amounted to 209,754*l.* 11*s.* 11*d.*, and the charge for the former nightly watch, in the same districts, was 137,288*l.* 18*s.* 6*d.* For this difference, 72,465*l.* 13*s.* 5*d.*, the inhabitants have the benefit of an efficient day police in exchange for an inefficient nightly watch, which was frequently entrusted to infirm old men. The expense chargeable on the parishes is limited to an assessment of eightpence in the pound on the rental, and all beyond this is defrayed from the public purse. Three-fourths of the whole expense are borne out of the parish rates, limited as above mentioned; and the remaining one-fourth is paid by the Treasury. The efficiency of the metropolitan police may in part be seen from the statement of the number of persons taken into custody by its constables, in each year since it came fairly into operation, and which were:—

1831	.	72,824	of whom	31 353	were drunk.
1832	.	77,543	..	32,636	..
1833	.	69,959	..	29,880	..
1834	.	64,269	..	19,779	..
1835	.	63,474	..	21,794	..
1836	.	63,384	..	22,728	..
1837	.	64,416	..	21,426	..

The total number of persons charged with offences by the metropolitan police force in the year 1838 was 71,802, of whom 48,742 were accused of petty offences, and the remaining 23,060 of crimes usually tried before a jury. Of these numbers 20,697 in the first class, and 14,820 in the second class, or about one-half, were discharged on a hearing by the magistrates, only 2951 were committed for trial, 15,876 were discharged on payment of fines—chiefly cases of drunkenness, and the remainder were sentenced summarily by the magistrates to various short periods of imprisonment. Among the persons committed for trial, 5 were accused of murder, 16 of manslaughter, and 88 of burglary and housebreaking: the others were charged with larcenies, breaches of the peace, and other offences of inferior degree.

It will be seen that a large proportion of the persons included in these numbers were taken into custody by reason of their being drunk, in which condition they hold out temptation to dishonest persons, and require to be protected.

It has been mentioned that this police force has no authority within the City. The day and the night police in the City were till lately established on two systems wholly unconnected with each other. The day police was under the control of a committee of the court of aldermen, and its operations embraced the whole city without any reference to its division into wards, while the duty of providing the nightly watch was left to the ward authorities, each ward supporting an independent establishment of its own. The day and night police are now consolidated, and consist of—

1 Superintendent.
12 Inspectors.
50 Sergeants.
438 Constables.

501

It is organised as nearly as possible on the plan of the metropolitan police, the City being divided for this purpose into 6 districts. There are besides, connected with the business of the justice-rooms, four men specially called police officers, and three men placed at the Mansion-house and Guildhall: the whole of this force is directed by the superintendent. Its duties are confined to the north side of the Thames, Southwark being under the metrop force.

There are further provided for preserving the peace of the metropolis, nine police offices, each of which has attached to it three magistrates. The offices are—

Bow Street, having attached to it	.	10 officers.
Queen Square, ,,	.	6 ,,
Marlborough Street, ,,	.	7 ,,
Marylebone,	.	7 ,,
Hatton Garden, ,,	.	6 ,,
Worship Street, ,,	.	7 ,,
Whitechapel, ,,	.	6 ,,
Union Hall, ,,	.	8 ,,
Thames Police, ,,	.	6 ,,

In addition to this there is a River Police attached to the Thames Police Office, and employing 22 Thames police surveyors and 70 river constables. The expense of these establishments is 51,724*l.* 5*s.* 5*d.* per annum. The horse-patrol was attached to the office in Bow Street until October, 1836, when it was made part of the metropolitan police force; it comprises a conductor, 4 inspectors, and 66 patrols. Their sphere of action is in the less frequented roads around the metropolis. Their respective beats and the hours of visiting different localities are continually being changed, according to the directions of the superintendents of police.

The sessions of the peace for the city of London are holden eight times in the year. The judges are the lord-mayor, aldermen, and recorder, any four of whom form a quorum, but the recorder is the acting judge. Before the establishment of the Central Criminal Court the jurisdiction of the London sessions court extended to all kinds of felonies, but in practice all crimes (except treason) which were capital by common law and all which have been called felonies by statute were tried at the Old Bailey sessions. The Central Criminal Court has twelve sessions in the year. This court was established 'for the trial of offences committed in the city of London, the county of Middlesex, and those parts of the adjoining counties which lie within the parishes of Barking, East Ham, West Ham, Little Ilford, Low Layton, Walthamstow, Wanstead, St. Mary Woodford, and Chingford, in Essex; Charlton, Lee, Lewisham, Greenwich, Woolwich, Eltham, Plumstead, Deptford, Kedbrook liberty, and Nottingham hamlet, in Kent; Southwark, Battersea, Bermondsey, Camberwell, Christchurch, Clapham, Lambeth, St. Mary Newington, Rotherhithe, Streatham, Barnes, Putney, Tooting, Graveney, Wandsworth, Merton, Mortlake, Kew, Richmond, and Wimbledon, in Surrey.' This new criminal court was established in 1834, under the act 4 and 5 William IV., c. 36, and empowers 'the lord-mayor of London, the lord chancellor, the judges, the aldermen, recorder, and common-sergeant of London, and such others as his majesty may appoint, to be judges of a court to be called the Central Criminal Court.' These judges or any two of them 'may determine all such treasons, murders, felonies, and misdemeanors as might be determined under any Commission of Oyer and Terminer for the city of London or county of Middlesex, or commission of gaol delivery to deliver the gaol of Newgate, at such times and places in the said city or suburbs thereof as by the said Commissioners shall be appointed.' The district thus described is to be considered as one county for all purposes under the act. The juries are summoned from London, or from the counties, or from both indiscriminately. The sessions thus authorised are to be holden twelve times at least in every year. This court is further empowered to try persons for offences committed on the high seas and other places within the jurisdiction of the admiralty of England, for which separate sessions used formerly to be held by the judges of the admiralty court. The great bulk of the cases brought before the Central Criminal Court are larcenies, unaccompanied by violence. The frequency of the sessions is found to be a great improvement; persons who may be wrongfully accused are speedily released, and the guilty are more quickly brought to justice.

Prisons.—There are nine prisons for the confinement of offenders within the metropolis. These are—

1. The Gaol of Newgate } in the City of London
2. The Giltspur-Street Compter
3. The Bridewell Prison
4. The New Prison, Clerkenwell, Middlesex County Gaol
5 The Coldbath-fields, County House of Correction
6. The Westminster, County Bridewell
7. The Horsemonger Lane, Surrey County Gaol
8. The Borough Compter
9. The Penitentiary at Milbank.

The Gaol of Newgate is under the control of the Corporation of London, and is the principal prison appropriated to the reception of persons brought before the Central Criminal Court. This prison has at various times been stigmatised as one of the worst regulated in the kingdom, and although various reformations have been attempted, but little effectual good appears to have been thus accomplished. In the third Report of the Inspectors of Prisons, presented to Parliament in 1838, it is stated 'that this great metropolitan prison, while it continues in its present state, is a fruitful source of demoralization, and a standing reproach on the character of the Corporation of the City of London.' The more heinous classes of offenders are placed in separate cells which are not warmed, have no privies, and are without stool or table, but in each of them is placed a Bible and Prayer Book. The numbers of persons confined in this prison in the course of the year ending Michaelmas, 1837, was 3349, of whom 802 were females. The greatest number at any one time in that year was 342, of whom 123 were females. The current expenses of the prison for the year amounted to 7785*l.* 15*s.* 10*d.*

The Giltspur-Street Compter is under the jurisdiction of the Lord Mayor and Court of Aldermen. Prisoners of every denomination and character are crowded together in the wards, yards, and sleeping cells of this prison without any possibility of classification, and, as we find it stated in the last Report of the Inspectors of Prisons, 'The Giltspur-Street Compter continues a wretched prison, with no efficient means of affording a salutary discipline. The prisoners are left together in large numbers in idleness and unrestrained communication during the whole 24 hours.' The number of prisoners confined there in the course of the year 1837 was 552 males and 130 females; the greatest number at any one time was 124 males and 48 females.

The Bridewell prison is under the jurisdiction of the governors of Bridewell and Bethlehem Hospitals, and is used for the reception of persons summarily convicted by the lord mayor or sitting aldermen. The prisoners are for the most part petty pilferers, misdemeanants, and vagrants: refractory apprentices brought before the aldermen or chamberlain of London are also sent here to solitary confinement for short periods. The prisoners were formerly employed, as a punishment, in beating hemp, which occupation has given place to the modern invention—the tread-wheel. The inmates are classified, and the *silent system* has been adopted. There were confined in this prison in the year ending Michaelmas, 1837, 770 males and 352 females; the greatest number at any one time was 90 males and 29 females. The current expenses in that year amounted to 1934*l.* 15*s.* 1*d.*

The new prison, Clerkenwell, is the general receiving prison of Middlesex for offenders committed, either for examination before the police magistrates, for trial at the sessions, for want of bail, and occasionally on summary conviction. Some degree of classification has latterly been attempted, but as the limits of the prison oblige 30, 40, or more prisoners to remain together in a small room, this division must be more nominal than real; the attempt is indeed limited to marking divisions on the floor, within which certain classes are desired to remain. The number confined in the year ending Michaelmas, 1837, was 4263 males and 2054 females, but the greatest number at any one time was 205 males and 109 females; the expenses for the year amounted to 3763*l.* 10*s.* 2*d.*

The Coldbath-fields County House of Correction is under the jurisdiction of 14 visiting magistrates appointed at each quarter-sessions · four go out of office quarterly by rotation. This prison contains felons, misdemeanants, and persons committed under the designation of rogues and vagabonds. It contains a tread-wheel. The prisoners are kept separate in classes in the different wards, and the silent system is strictly enforced. The discipline is said by the prison inspectors to be extremely good. In the year ending Michaelmas, 1837, there were confined 6625 males and 3125 females; the greatest number at any one time having been 929 males and 319 females; the expense to the county, exclusive of alterations and repairs, was 13,455*l* 14*s.* 9*d.*

The Westminster County Bridewell in Tothill-fields is under the jurisdiction of the magistrates for the City of Westminster. It is a modern building, having been first occupied in 1834: it cost upwards of 200,000*l.* The prison contains 42 day-rooms and 348 sleeping apartments, in addition to 120 dark cells in the basement. The classification of prisoners is accomplished to a great extent. Prisoners who have been convicted are subjected to the silent system. There are two tread-wheels in the prison, and two schools have been established, one for boys, the other for girls, under 17 years of age, who are committed to the prison. In the year ending at Michaelmas, 1837, there were confined 3085 males and 2439 females; the greatest number at any one time was 438, of whom 159 were females. The current expenses of the prison were 5578*l.* 7*s.* 4*d.*

The Surrey County Gaol, in Horsemonger Lane, Southwark, is under the jurisdiction of the sheriff, court of quarter-sessions, and 12 visiting magistrates of the county of Surrey. This prison contains debtors as well as criminals of all degrees, which latter are not classified, nor kept separate to any useful extent. In the course of the year, to Michaelmas, 1837, there were in this prison 1193 male and 107 female debtors. Of other prisoners the numbers were 1901 males and 605 females; the greatest number of these at any one time was 233 males and 62 females, together 295. The expense in that year was 3316*l.* 0*s.* 2*d.*

The Borough Compter, in Mill-lane, Tooley Street, is under the jurisdiction of the lord-mayor and court of aldermen of London, and the high-bailiff of Southwark. The prisoners consist of debtors, of persons committed for trial for felonies and misdemeanors, and others tried and sentenced to imprisonment, but not to hard labour; those prisoners who are sentenced to labour are sent to the County House of Correction at Brixton. The defects in the discipline and management of this prison were strongly animadverted on by a Committee of the House of Commons in 1829, and in their Report of 1838 the Inspectors of Prisons remark that 'its general state is as deplorable at this moment' as it was then. In the year ending Michaelmas, 1837, there were confined 273 male and 32 female debtors; 688 males and 464 females accused of offences; the greatest number of these at any one time was 69, of whom 23 were females: the expenses of the prison were 878*l.* 19*s.* 8*d.*

The Penitentiary at Milbank was established in 1820, and placed under the direction of the Secretary of State for the Home Department. It is built upon the plan recommended by the late Mr. Jeremy Bentham, which admits of the most perfect classification and supervision: it cost nearly half a million of money, and is capable of containing 1100 prisoners. The whole establishment is managed by a committee appointed by the Secretary of State. The prisoners are in great part persons sentenced to transportation or to death, whose punishment has been commuted to imprisonment, and it has no peculiar connexion with the police of the metropolis.

Lighting.—The whole of London is now well lighted with coal-gas. In 1694 it appears that the City was partially lighted with lamps. By the act passed in that year under which the Orphans' Fund was created, the sum of 600*l.* per annum was assigned towards that fund as 'arising from a lease granted for 21 years by the corporation, of certain lights to be used in the City;' from which it may be inferred, that the city authorities in those days derived a revenue from granting the privilege of lighting to private parties, who must of course have taken their remuneration from householders. At the expiration of the lease here mentioned, viz. in 1716, an act was passed by the municipal parliament repealing all former laws upon the subject, and ordering that for the future every housekeeper should hang out a light before his door with sufficient cotton-wicks to burn from six o'clock in the evening until eleven of the same night, after which hour the streets were consequently left in darkness. The housekeepers were at liberty to discontinue the lighting of their street lamps between the seventh night after each new moon and the third night after it arrived at the full—an instance of economy which is still practised in many of the provincial towns of this kingdom. Every housekeeper who should omit to hang out the necessary light on all other nights was fined one shilling for each offence. This system proved to be exceedingly troublesome and unsatisfactory; and after a few years a company was established which in return for a payment of six shillings per annum, which it was authorised to demand from each householder rated for the support of the poor within the city, engaged to provide a sufficient number of lamps and to keep them lighted from six o'clock until midnight. The company further engaged to pay to the Orphans' Fund the yearly sum of 600*l.* above mentioned. The insufficiency of the light thus provided may be inferred from the numerous depredations then committed in the city by highwaymen, who, riding into the streets after nightfall, perpetrated their outrages with impunity. This evil rose to such a height that government found it necessary to offer a reward of 100*l.*, a large sum in those days, for the apprehension of every highwayman in the city of London or within five miles of the same. After these evils had been endured for some years a further and a more effectual improvement was introduced. The contract just mentioned was cancelled, and an act of parliament was procured in 1736, authorising the corporation to set up as many glass lamps as should be necessary, and to keep them lighted throughout the year from the setting to the rising of the sun. To defray the cost the corporation was empowered to levy an annual rate upon every householder proportioned to the value of his house. This system was found to answer well, and continued in operation until the introduction of gas-lighting. During the 70 years that intervened London enjoyed the reputation of being the best lighted city in Europe, but no person, unless he can remember the nightly appearance of the metropolis previous to the adoption of gas lighting, can be sufficiently aware of the value of the improvement, nor of the degree in which it operates as a measure of police. The lamps are now lighted by various joint-stock companies possessing large capitals, and which are content to derive a low rate of remuneration for the lighting of street-lamps, in return for the opportunity of supplying shops and private houses, which pay more liberally. The first established of these gas companies received a charter of incorporation in 1812; it has three stations, one in the Horseferry-road, Westminster, another in Brick Lane, Old Street, and the third in the Curtain Road, Shoreditch. Several other companies have since been established; the more important of these are, the City of London, the Imperial, the British, the Independent, and the Equitable gas companies; these supply among them more than 60,000 lights over a field extending from Bow on the east to Brentford on the west, and from Edmonton on the north to Brixton on the south. Their aggregate incomes for these lights, derived from parishes and private consumers, exceed a quarter of a million of money per annum: of this sum the corporation of London pays about 10,000*l.*

Sewers.—The sewers of the metropolis and adjacent districts, comprehending a circle of ten miles, measured from the Post-Office, are divided into seven trusts, and placed under the management of as many boards of commissioners, viz.:—

1. The City and Liberties of Westminster.
2. Holborn and Finsbury division.
3. Blackwall, Poplar, and Stepney division.
4. The City of London.
5. The Tower Hamlets division.
6. From the river Ravensborne, in Kent, to the river Mole, in Surrey.
7. Regent Street division.

There are no means of ascertaining the aggregate length of the sewers throughout these divisions. Those under the commissioners for the City of London are about 15 miles in extent, and form only a small part of the drainage of the whole metropolis. Sewers were first constructed in London in the reign of Henry VI., under an act (6 Hen. VI., c. 5) passed in 1428. This act was amended by parliament in the reign of Henry VIII.; and the law relating to sewers, passed in the twenty-third year of that reign, is still substantively adhered to by two of the seven boards of commissioners, the fifth and sixth of the above list; the other five boards are regulated by local acts. The expenses attending upon the construction and management of sewers in the different districts are repaid by means of rates levied upon the householders at the discretion of the several boards of commissioners. In the City of London the rate cannot exceed 4*d.* in the pound on the rental. Much dissatisfaction existed some years ago in regard to the efficiency of the sewerage in different parts of the metropolis. Drains which had been adequate to the drainage and cleansing of a district in former times were rendered by degrees wholly inadequate, through the increase of the population. Much has of late years been done to meet this objection; the subject has been investigated by a Committee of the House of Commons, appointed in 1834; and although there are still some obscure corners where the health and comfort of the inhabitants might be improved by a better attention to the sewers, it may be fairly stated that the drainage and the removal of impurities from London are, upon the whole, satisfactorily accomplished. The sum collected in the City of London district for sewers-rate in 1838 was 12,214*l.* 8*s.* 1*d.*

Fires.—An important part of the police of a city consists in the measures taken for the prevention and extinction of accidental fires. After the Great Fire of London, in September, 1666, an order was issued forbidding any person to proceed in rebuilding his premises until some general plan should be devised for rebuilding the city in such a manner as should prevent the recurrence of a similar misfortune. The chief improvements introduced at that time consisted in widening the streets and employing bricks for building the houses instead of wood and lath and plaster, which had previously been very generally used. The regulations adopted on that occasion were extended and improved from time to time by various acts of parliament until 1774. In that year an act was passed (14 Geo. III., c. 78), commonly called the Building Act, repealing former acts, regulating the mode of building so as to render houses 'ornamental, commodious, and, by providing party-walls of a certain thickness, secure against the accidents of fire.' Under this act it was further rendered incumbent on churchwardens to provide one or more fire-engines in every parish, to be in readiness on the shortest notice to extinguish fires; and also to have in constant readiness ladders to favour the escape of persons from burning houses. It was further made incumbent on the churchwardens to fix fire-plugs at convenient distances upon all the main water-pipes within the parish, and to have keys to open the same, so that the water might be instantly made available. Graduated rewards were also established by the same acts to persons bringing the first three parish engines for the extinction of a fire. These measures have since been greatly aided by the various offices for insuring property against fire, which have maintained, at their own charge, numerous fire-engines and corps of firemen. The legislature on its part gave facility to the officers by granting protection against impressment into the navy to those firemen who were chosen from among the watermen and lightermen employed upon the Thames. Until a recent date each of the insurance offices maintained its own engines and corps of firemen independently of all other similar establishments. A few of the most extensive made an arrangement among themselves in 1825, by which their engines and firemen were placed under the orders of one superintendent; but it was not until 1833 that the fire-offices of London became generally united for this purpose under one uniform system, each office subscribing towards the expense of the establishment in a certain agreed proportion. Under this arrangement, which is superintended by a committee of delegates, one from each of the associated offices, London is divided into five districts, three on the north and two on the south side of the Thames, viz.:—

North. 1. From the eastward to Paul's Chain, St. Paul's Churchyard, Aldersgate Street, and Goswell-street-road.
" 2. From the above district to Tottenham-court-road, Crown Street, and St. Martin's Lane.
" 3. Parts to the westward of the foregoing.
South. 4. From the eastward to Southwark-bridge-road.
5. From Southwark-bridge-road westward.

The force employed consists of a superintendent, 5 foremen, 10 engineers, 9 sub-engineers, 31 senior firemen, 35 junior firemen and 6 extramen, and the number of engines in constant readiness is 33, which are kept at 20 different stations in various parts of the metropolis: two are floating-engines, kept on the river, one moored off King's Stairs, Rotherhithe, the other off the Southwark Bridge. One-third of the men employed are constantly on duty, day and night, at the engine-houses, and the whole are liable to be called upon whenever a fire occurs. The superintendent, who must repair to the spot, wherever it may be, when a fire breaks out, has power to employ any additional number of men that may be wanted. The firemen are uniformly clothed, and have their heads protected with helmets made of hardened leather; they are provided with the most approved apparatus for the suppression of fires, the rescue of human life, and the saving of property; including ropes and lengths of scaling-ladders capable of being readily connected to any required length. The advantages attending an organized force of this description must be apparent. We have no record of the number of fires that occurred previously to its establishment in the metropolis, but a record has since been kept from which the following particulars are taken:—

Year.		Number of Fires.	Wholly burnt.	Severely damaged.	Slightly damaged.	Fires in which lives were lost.	Number of lives lost.
1833	..	458	31	135	292	5	12
1834	..	482	28	116	338	5	7
1835	..	471	31	125	315	7	11
1836	..	564	33	134	397	14	14
1837	..	501	22	122	357	16	13
		2,476	145	632	1,699	47	57

Revenues, &c.—The revenue of the corporation of the City of London is derived from various sources, the principal of which are rents of premises, dues, and market-tolls. The receipts and expenditure for the years 1831 and 1832, as given in to the Municipal Corporation Commissioners, were as follows:—

RECEIPTS.	1831.	1832
Rents and quit-rents	£46,900 9 10	£45,998 4 6
Rents and navigation of Thames	1,249 1 5	905 17 2
Fines for leases	2,712 14 4	2,112 2 0
Markets, tolls, offices, and bequests	85,135 9 7	86,967 8 9
Brokers' rents and admissions	3,605 0 0	3,902 0 0
Freedoms sold	4,325 0 0	3,550 0 0
Casual receipts	2,174 18 7	1,635 3 1
Insurance of officers' lives	154 16 9	—
Interest on government securities	4,480 8 4	5,198 11 8
Sale of securities	—	8,461 8 6
Sale of premises	25 0 0	—
Balance of cash in hand	24,111 19 3	26,735 19 2
Freedoms and enrolments	1,272 10 2	1,402 16 8
	£176,147 8 3	£186,929 10 10
EXPENDITURE.		
Orphans' Fund	£12,078 12 0	11,679 6 4
Rents and quit-rents	2,478 15 7	2,489 17 7
Mansion-house expenses	1,529 15 6	5,726 18 3
Expense of magistracy, police, and prisons	28,152 9 7	36,788 14 0
Conservancy of river Thames	3,015 18 1	3,743 2 5
Artificers' and tradesmen's bills	3,160 18 11	2,081 2 9
Market charges	5,309 14 3	5,201 4 3
Law and parliamentary expenses	5,731 13 4	5,537 1 4
Return-duty on imported corn	720 9 6	1,073 8 0
Charitable donations	2,557 0 0	3,793 6 3
Salaries and allowances	24,231 10 6	24,945 6 1
Disbursements—Courts of Aldermen and Common-Council	11,446 6 8	23,040 7 2
Royal and reform entertainments	2,995 17 2	—
Bequests	909 6 10	1,022 5 10
Insurance paid	5,000 0 0	3,611 5 0
Interest and annuities	8,334 19 0	8,198 10 9
Purchase of securities	12,000 0 0	12,000 0 0
Debts discharged	10,000 0 0	15,024 5 9
Money lent	4,000 0 0	—
Purchase for lord-mayor's household	5,708 2 2	2,699 19 0
Balance in hand	26,735 19 2	17,673 10 2
	£176,147 8 3	186,929 10 10

The first item in the above statement of expenditure requires some explanation. The court of the lord-mayor and aldermen of London had from time immemorial acted as the guardians of the children of decease dcitizens, and as trustees of their property. The corporation having advanced large sums to the government upon the security of Exchequer Tallies, which were totally lost to them upon the shutting of the Exchequer in 1672, this circumstance, with the losses occasioned by the Fire of London, occasioned a deficiency in the sum owing to its orphan wards and other creditors of 747,472*l.* An act was accordingly obtained (5 and 6 Will. and Mary, c. 10), entitled 'An Act for the relief of the Orphans and other Creditors of the City of London,' in the preamble of which the above-mentioned deficiency is attributed to 'sundry accidents and public calamities,' which act established a fund for the payment of the interest upon the above sum, which payment of interest for ever was declared to be in full satisfaction of the debt. The fund created consisted of a charge of 8000*l.* per annum on the lands and revenues of the city; the profits of aqueducts, or the right of bringing water into the city; 2000*l.* per annum to be levied by assessment on the inhabitant householders; 600*l.* per annum arising from the lease granted of the right of lighting lamps, as elsewhere explained; a tax of 2*s.* 6*d.* on binding each apprentice to a freeman; and of 5*s.* upon every person admitted to the freedom of the city; 4*s.* per tun upon wine imported into London; and 4*d.* per chaldron on the metage of coals; and ıaldron upon all coals imported. The last tax was ınce in 1700, and to continue for 50 years; after : lands of the city were to be charged with 6000*l.* m more in favour of the orphans' fund; but in coal-tax was renewed for 35 years; and in 1767 ther extended to 1831; and it was afterwards con- › 1837. The debt for which these charges were made was fully discharged in 1820, the duties having been rendered more productive than was owing to the great increase of the city; but it was nvenient to continue them in order to provide for ırge of debts otherwise and subsequently incurred ıus buildings and improvements, among which ıentioned Blackfriars Bridge, Newgate prison, the k sessions-house, and improvements at Temple Snow Hill. More recently the coal duties have tinued on account of a million of money borrowed suitable approaches to the new London Bridge.

ıtal produce of the various charges and duties d by the act of 1694 produced between that year is as follows:—

ınts from city revenues .	£1,324,750
ucts	62,441
ments on inhabitant householders .	203,907
. . .	21,000
ıtice bindings . .	34,277
ıms	41,250
ın wine	363,442
e and duty on coals .	3,718,059
' ground, &c. . .	50,975
	£5,820,101

ıssing of the bill through parliament (1694) to au- ıe levying of these duties was accompanied by an ex- ry circumstance. Considerable delay having been ɜed in the proceedings of the House of Commons, the ıberlain was authorized to disburse such sums as ɜ found necessary for expedition. Through some :aution the government came to suspect that bri- used, and a committee of the House of Commons pointed to investigate the matter, it came out that ker had actually received 1000 guineas for his ser- ɜxpediting the bill through the house, and that two mbers had been guilty of similar corruption. The re consequently forthwith expelled from the house. eehold estates belonging to the corporation within are situated chiefly in and about Broad Street, ch Street, Aldgate, and the Minories. It has also ɜrable estate in the parish of St. George's, Hanover and possesses five-sixths of a leasehold estate under ter of St. Paul's This lease has been held since ınning of the fourteenth century, and will expire in 'he net produce to the city arising from ground- 7500*l.* per annum, but the annual value which will the church in 1867 is expected to amount to or 60,000*l.*

ıf the companies are in possession of real property ey in the public funds, but as many of them refuse the nature and amount of their property, it is ble to speak more precisely on the subject. The ' Company made a return to the Municipal Corpo- Commissioners, from which it appears that their ents amount to 23,400*l.*; and the Fishmongers like manner stated their income from real pro- be 17,973*l.* per annum. It is known that other es, and particularly the Mercers, Goldsmiths, and ıt Tailors, hold large landed estates within the city on, and elsewhere, both for their own use, and on trusts; but the particulars of these estates are not ıblic.

:ish Society is a corporation connected in a pecu- ıner with the corporation of London. The origin onnection was as follows. In the reign of James I. erable part of the province of Ulster was forfeited ·own, and proposals were entertained for establish- English colony in that province. In pursuance of ɜme articles of agreement were executed in Janu- 9, between the lords of the king's council and ittee appointed by the common-council acting on f the mayor and commonalty of the city of London ılishing corporations in Derry and Coleraine. It was l that 20,000*l.* should be advanced by a London company, to consist of a governor, deputy-governor, and 24 assistants; that the governor and five assistants should be aldermen of London; that the recorder should be another assistant, and that the deputy-governor and the rest of the assistants should be citizens of London, to be elected annually by the common-council. The Society, being thus appointed, was soon after put in possession of the estates. The sum subscribed for the purpose amounted eventually to 60,000*l.*, and was chiefly furnished in different proportions by the most wealthy of the London companies. [LONDONDERRY.] The Society was incorporated on the 29th of March, 1619, and the town of Coleraine and the county of Londonderry were granted to the Society and their successors for ever. By another charter granted to the Society by Charles II. in 1662, power was given to the common council of Londonderry to make bye-laws for the government of the city, but to give them validity it was necessary that these bye-laws should be confirmed within a limited time by the Irish Society. The accounts of the Society since 1831 have been printed and laid before the court of common-council. The estates have been the subject of a suit in chancery, which has confirmed the title of the corporation to all except the lands that had been granted to the companies.

Pauperism.—Although employment may easily be obtained in London by persons in health, and adequate wages are paid, a considerable proportion of these wages are spent in intemperance, which adds largely to the amount of wretchedness owing to misfortune, sickness, and other causes. Under the orders of the commissioners for executing the act of 1833 for the amendment of the law relating to the poor, the metropolis, so far as it has hitherto been brought under the provisions of the new poor law, is divided into 26 districts or unions, as enumerated and described below, each of which is managed by a board of guardians, elected by the rate-payers of every parish within the union: in some cases the parishes are too large and populous to admit of their being satisfactorily united for this purpose; and some parishes are governed under special and local acts of parliament, which oppose difficulties to such junction. The divisions, the amount of their population in 1831, the number of guardians elected in each, and the sums expended for relief of the poor in the year ending 25th March, 1838, are as follows:—

	Population, 1831.	No. of Guardians.	Expended for Relief of Poor in Year ending 25th March, 1838.
Holborn Union	42,649	20	£11,527
St. George's in the East .	38,505	18	11,683
St. Leonard's, Shoreditch .	68,564	21	17,318
St. Martin in the Fields .	23,732	24	9,318
St. Matthew, Bethnal Green	62,018	20	14,218
St. Pancras	103,548	20	19,921
Strand Union	41,820	21	14,494
Bermondsey	29,741	18	10,281
St. George, Southwark .	39,769	18	10,938
Camberwell	28,231	15	7,946
Lambeth	87,856	20	24,598
Newington	44,526	18	9,559
Rotherhithe	12,875	15	5,261
St. Olave, Southwark . .	20,021	15	5,897
St. Saviour, Southwark .	31,711	17	11,185
Stepney	72,446	23	26,426
Poplar	25,066	15	10,519
Edmonton	46,510	38	15,164
City of London (98 parishes)	57,080	101	45,850
Whitechapel	64,141	25	16,426
Greenwich	62,009	20	15,593
Lewisham	18,426	20	5,993
Kensington	75,395	25	16,293
Hackney	34,527	18	8,689
East London	38,311	20	19,233
West London	27,825	20	17,522

Begging is followed as a trade or profession in the metropolis perhaps more systematically than in any other city. The subject has at various times attracted the attention of the legislature, and considerable light has been thrown upon it by the Reports of committees of the House of Commons. In one of these Reports it was stated on evidence that two houses in St. Giles's parish (which is the principal resort of beggars) are frequented by considerably more than 200 persons, who hold in them a kind of club, from which all are not of their profession are excluded; that child let out by the day, and that the hire paid for deformed children is sometimes as high as four shillings per day, and that a regular school is kept in the same district where children are instructed in the arts necessary to their success as beggars. It has been stated that the number of professional beggars in and about London amounts to 15,000, more than two-thirds of whom are Irish: but this statement rests upon no certain foundation, and has been variously considered as too high or too low, according to the views which different persons take of the condition of society. It is ascertained that few of the street-beggars who pretend to be husband and wife are really married. The Mendicity Society was formed in 1818 for the purpose of remedying this evil, by affording relief to really deserving persons, and by exposing and punishing the professional beggar and impostor. This Society has an office and establishment in Red Lion-square, Holborn, and has, through the constant activity of its managers, been instrumental in moderating the evil, which however is too great in degree to be successfully combated by any merely private association.

Savings' Banks.—The various savings' banks that are open within the limits of the metropolis are no doubt resorted to by some persons who reside beyond it; and it is therefore not possible to ascertain with precision the amount of deposits made by the metropolitan population. After a careful examination of all the returns and other documents extant upon the subject, it appears that there were, on the 20th November, 1837, about 97,000 individuals resident within the metropolitan limits who had accounts open at the different savings' banks, and that the sum standing at the credit of their accounts was about 2,450,000*l.*, being 18 per cent. of the total number of depositors in England, and 15 per cent. of the total amount of their deposits. It is supposed that the class of domestic servants, who are very numerous in London, forms by far the largest proportion of depositors in savings'-banks.

Charities, Hospitals, &c.—The public charities and hospitals within the limits of the metropolis are very numerous, and many of them richly endowed. The royal hospitals of Greenwich for seamen and of Chelsea for soldiers are national establishments, and wholly independent of private support. The revenues of Greenwich Hospital are derived partly from estates in Cumberland, on which lead-mines are profitably worked, and partly from a payment of sixpence per month stopped from the wages of seamen, and in time of war from unclaimed prize-money. In Greenwich Hospital there are usually about 3000 maimed and superannuated seamen, who are boarded, lodged, and clothed, and provided each with one shilling per week pocket-money. There are besides about 32,000 out-pensioners receiving various allowances from 3*d.* to 1*s.* 6*d.* per diem. The great officers of state are nominally governors of the hospital; but it is really managed by twenty-four directors, a governor, and a lieutenant-governor. Chelsea Hospital, which is for the army, accommodates about 400 in-pensioners, and a great number of out-pensioners. The expenses are defrayed by means of contributions stopped from the pay of every officer and private soldier in the army; the deficiency, if any, being provided for by parliament. The establishment is under the direction of commissioners, a governor, and a lieutenant-governor. Connected with these two hospitals are the Royal Naval Asylum at Greenwich and the Royal Military Asylum at Chelsea, the former for the education and maintenance of 800 boys and 200 girls, the children of seamen of the Royal Navy; the latter for giving the same advantages to 700 boys and 300 girls, the children of soldiers.

The charities connected with the corporation of London are Christ's Hospital, better known as the Blue-coat School, Bridewell and Bethlehem Hospitals, St. Bartholomew's Hospital, and St. Thomas's Hospital, all of which were founded by Edward VI. Christ's Hospital contains about 1200 boys, to whom good classical, commercial, and mathematical instruction is given. They are also boarded and clothed: the annual expenses of the establishment amount to 30,000*l.* The lord-mayor and corporation of London are directors of the hospital; there are besides about 350 governors, each one of whom, at his election to the office, presents 400*l.* to the institution. The children are admitted on the nomination of the directors and governors, who exercise their privilege in rotation. Bridewell Hospital, which is under the management of the same board of governors as Bethlehem Hospital, is now used only as a prison, under which head it is noticed. Bethlehem Hospital, first erected in 1675 in Moorfields, was removed in 1814 to Saint George's Fields. It is employed for the reception and treatment of insane patients, of whom about 200 are constantly accommodated. This has lately been found inadequate to the wants of the poor who are thus afflicted in the city of London, and the building is at this time (January, 1839) receiving two additional wings. [As to St. Bartholomew's Hospital, see BARTHOLOMEW'S HOSPITAL.]

St. Thomas's Hospital, in Southwark, is governed by the lord-mayor, aldermen, and 12 common-councilmen of London, and 180 governors through donations of 50*l.* and upwards. It is capable of receiving and usually contains nearly 500 patients; besides whom it affords relief to a considerable number of out-patients, who receive advice and medicines gratuitously. There is a medical school attached to this hospital. Other corporations dependent on the corporation of London are, the corporation of the London Workhouse. The Commission of Sewers, Carpenters' School, &c.; and Gresham College, held in conjunction with the Mercers' company.

The other hospitals of the metropolis have been founded and are supported by private benevolence.

Guy's Hospital, St. Thomas's Street, Southwark, founded 1721, and richly endowed by Mr. Guy. A bequest of 200,000*l.* was made to its funds in 1829 by Mr. Thomas Hunt. It contains more than 400 beds, and medical aid is gratuitously afforded to out-patients.

London Hospital, Whitechapel Road, established 1740, and supported by voluntary contributions and subscriptions, gives relief to upwards of 2000 patients in the course of the year, the greater part of whom are surgeons' patients through accidents among the shipping on the river and in the docks, and the various manufactories in the eastern part of London. It has three physicians, three assistant-physicians, three surgeons, and three assistant-surgeons.

Charing-Cross Hospital, King William Street, West Strand, established in 1818, erected in 1831, is supported by voluntary subscriptions. It has an establishment of three physicians and two surgeons.

Westminster Hospital, established 1719; the present building was erected in 1833. It is capable of receiving 230 patients.

St. George's Hospital, Hyde Park Corner, instituted in 1733. The hospital has been recently rebuilt. There are usually nearly 300 in-patients, besides a considerable number relieved as out-patients. Four physicians, with an assistant-physician, an equal number of surgeons, two assistant-surgeons, a house-apothecary, and four visiting-apothecaries are attached to this hospital.

Middlesex Hospital, Charles Street, Oxford Street, instituted 1745, is capable of containing 300 patients, and affords relief also to many out-patients. Persons meeting with accidents are admitted at all times without recommendation. This hospital, which has an adequate number of physicians and surgeons, is supported by voluntary contributions and subscriptions.

The University College Hospital, built on ground opposite and belonging to University College, was opened in November, 1834. It contains beds for 130 patients, and is the hospital for the medical school of the College.

All the above hospitals have medical schools attached to them.

Saint Luke's Hospital, City Road, instituted in 1751, for the reception of poor insane persons, being parish paupers or others. With every parish-patient a sum of 4*l.* must be paid to the hospital; other patients must pay only 1*l.*, which is returned in case of death, or if the patient is discharged within a month. The hospital will accommodate 300 patients. The affairs are managed by governors contributing twenty guineas and upwards to the funds of the hospital.

Small-pox Hospital, St. Pancras, instituted 1746, is supported by voluntary contributions. Since 1799 vaccination has been adopted in this hospital, and upwards of 100,000 persons have been vaccinated by its medical officers. There is also a 'National Vaccine Establishment' in Russell Place, having in connection with it eleven 'vaccinating surgeons' residing in different parts of London and its environs.

London Fever Hospital, St. Pancras, adjoining the Small-pox Hospital, receives at all hours cases of typhus and scarlet fever without recommendation. It is supported by donations and subscriptions, and is at present increasing its means of accommodation.

Lock Hospital, Grosvenor Place, Pimlico, contains 80 patients' beds, viz. 45 for males and 35 for females. It usually receives between 500 and 600 patients during the year.

There are four Lying-in hospitals in various parts of the town, viz.: Queen Charlotte's, founded 1752, situated at Lisson Green, Paddington; the British, 1749, Brownlow Street, Drury Lane; the City of London, 1750, City Road; the General, 1765, York Road, Lambeth.

A floating hospital was instituted in 1821 for the reception of sick and disabled seamen of all nations, who may present themselves without any recommendation. The Dreadnought, a ship of 104 guns, was given for this purpose by the government properly fitted up, and is constantly moored off Greenwich; it is supported by voluntary subscriptions, chiefly from owners and masters of ships trading to the port of London.

There are two Ophthalmic Hospitals, one in Moorfields, established in 1805, the other in Chandos Street, Charing-Cross; two Royal Infirmaries for diseases of the Eye, one in Cork Street, Burlington Gardens, the other in Little Portland Street, Cavendish Square; an Infirmary for diseases of the Skin, in Blenheim Street, Oxford Street; an Infirmary for diseases of the Lungs, in Artillery Street, Bishopsgate; a Royal Universal Infirmary for Children, in the Waterloo-bridge Road; a Royal Metropolitan Hospital for Sick Children, in Broad Street, Golden Square; a Royal Dispensary for diseases of the Ear, in Dean Street, Soho; and eighteen General Dispensaries, situated in various parts of the metropolis, and supported by the residents in the different localities where they are found.

The charitable institutions of the metropolis are so various and so numerous that only the following list of those which are most important can here be given, with the dates of their establishment, as far as can be ascertained.

- Foundling Hospital, founded by T. Coram, incorporated 1739.
- Scottish Hospital, for relief of natives of Scotland, founded in 1665.
- Magdalen Hospital, for penitent prostitutes, established 1758.
- London Female Penitentiary, for the same purpose, established 1807.
- Hospital for French Protestants, established 1716.
- Jews' Hospital, for aged poor and education of children, established 1803.
- School for the Indigent Blind, established 1799.
- Orphan Working School, established 1760.
- Female Orphan Asylum, established 1758.
- London Orphan Asylum, established 1813.
- Infant Orphan Asylum.
- Adult Orphan Institution.
- British Orphan Asylum.
- Clergy Orphan Asylum, established 1749.
- Merchant Seamen's Orphan Asylum.
- Sailors' Female Orphan Home, established 1829.
- National Benevolent Institution, founded in 1812.
- City of London General Pension Society, established 1818.
- East London Pension Society.
- General Annuity Society, established 1827.
- Philanthropic Society, established 1788.
- General Philanthropic Society, established 1813.
- Society for relief of distressed Schoolmasters.
- Literary Fund for relief of Distressed Authors, established 1790.
- Marine Society for reception of Poor Boys to be sent to Sea, established 1756.
- Deaf and Dumb Asylum, established 1792.
- Artists' Benevolent Fund, established 1810.
- Artists' General Benevolent Institution, established 1814.
- Royal Masonic Institution, instituted 1798.
- Society for Discharge of Persons imprisoned for Small Debts, established 1772.
- Corporation of the Refuge for the Destitute, established 1805.
- Childrens' Friend Society, for Prevention of Juvenile Vagrancy, established at Hackney Wick, 1830.
- Royal Humane Society, for recovery of persons apparently dead, established 1774.
- St. Ann's Society Schools, established 1709.

The principal charitable establishments, for the purpose of instruction only, are:—

- The Westminster School, established by Queen Elizabeth in 1590.
- St. Paul's School, founded by Dean Colet in 1510.
- Merchant Taylors' School, established 1561.
- St. Olave's Free Grammar-School, founded by Queen Elizabeth.
- Mercers' Free Grammar-School.
- St. Saviour's Grammar-School, founded 1562.
- British and Foreign School Society.
- National Society for the Education of the Poor.
- Society for promoting Christian Knowledge, instituted in 1699.

The educational establishments of a public character, but not charitable, are:—

- University College, London.
- King's College, London.
- School of the Corporation of the City of London.
- The Charter House, founded by Thomas Sutton in 1611, is an hospital, which has a school attached to it. [Charter House.]
- The University of London, incorporated in 1837, consists of a chancellor, vice-chancellor, and thirty-six fellows, who are empowered to confer degrees in arts, law, and medicine. The university chambers are at present in Somerset House. It is principally supported by grants from government. The first examination for matriculation in arts took place in November, 1838. The first examination for degrees will take place in May or June, 1839.

Of societies and establishments connected with science, literature, and the arts, the following are the principal:—

- The British Museum.
- The Royal Society, incorporated 1663.
- The Society of Antiquaries, founded 1572.
- The Society for the Encouragement of Arts, &c., established 1754.
- The Royal Academy of Arts, incorporated 1765.
- The Royal Institution, incorporated in 1800.
- The Linnæan Society, established 1802.
- The British Institution, established 1805.
- The Geological Society, established in 1813.
- The Society for the Diffusion of Useful Knowledge, established in 1826, incorporated in 1832.
- The Horticultural Society, established 1808.
- The Mechanics' Institute, in Southampton Buildings, established in 1823.
- The Royal Astronomical Society, established in 1820.
- The Royal Geographical Society, established 1830.
- The Royal Asiatic Society, established 1823.
- The Zoological Society, established 1829.
- The Architectural Society, established 1831.
- The Royal Society of Literature, established in 1820.
- The Society of Civil Engineers, established in 1828.
- The Statistical Society, established 1834.
- The Royal Institute of British Architects, established 1835; incorporated by charter 1837.
- The London Institution, established 1806.
- Sion College, incorporated 1630.
- Entomological Society, instituted in 1806.
- Phrenological Society.
- City of London Literary and Scientific Institution.
- College of Physicians, established in 1518.
- College of Surgeons.
- Company of Apothecaries.
- And several medical societies.

Of late years numerous literary and scientific institutions have been established within the metropolis: their general objects are the same, being the communication of useful knowledge by means of lectures, classes, the formation of libraries, and collections of various kinds.

The principal places of public amusement in the metropolis are:—

- The Queen's Theatre (Opera House), Haymarket.
- The Theatre Royal, Drury Lane.
- ——— Covent Garden.
- ——— Haymarket.
- The English Opera House, Strand.
- The Royal Adelphi Theatre, Strand.
- The Olympic Theatre, Wych Street.
- The St. James's Theatre.
- The Surrey Theatre.

The Victoria Theatre, Waterloo Road.
The City of London Theatre, Norton Falgate.
The Pavilion Theatre, Whitechapel Road.
The Garrick Theatre, Goodman's Fields.
Astley's Amphitheatre.
Sadler's Wells Theatre.
Royal Fitzroy Theatre, Tottenham Court Road.
Vauxhall Gardens.

The places of general recreation are:—St. James's Park, Hyde Park, Kensington Gardens, the Regent's Park, and Greenwich Park, on the banks of the Thames at Greenwich. With the exception of Greenwich Park, they may all be considered to be in London, and are easily accessible to all the inhabitants of the metropolis.

Trade, &c.—The accidental burning of the Custom House of London, in February, 1814, in which the greater part of the trade records of the port and kingdom were destroyed, renders it impossible to give a complete account of the commerce of the metropolis for any preceding period. The relative proportion of the foreign and colonial trade enjoyed by its merchants during the present century will be sufficiently shown by the following statement of the net amount of customs duty, collected at different times from the year 1815, in London and in all the various ports of the United Kingdom, including London:—

Year.	London.	United Kingdom.
1815	£5,536,441	10,521,551
1820	5,342,731	9,837,279
1824	5 731 238	11,327 741
1826	8 829 789	17,280,711
1827	8,790 829	17,894,405
1828	8,918 310	19,295,403
1829	8 524 261	19,129 615
1830	8,576,163	19,360,750
1831	7,916,993	18,124,725
1832	7,876,660	18,341,188
1833	7,662,521	17,597,697
1834	9,576,972	18 494 316
1835	10,601,600	20,522 895
1836	11,088 207	21,448,741
1837	10,190,006	20,556,539

It appears from these figures, which are taken from official returns, that the payments into the Exchequer by the Custom House of London amount to as much as the net receipts of all the other custom-houses in Great Britain and Ireland. It was expected that the opening of the China trade, and the consequent participation of other ports in the tea trade, which had previously been monopolized by London, would have considerably altered the above proportions; but it will be seen that such has not been the result: in fact, the buyers of this article of general consumption still resort to London as the market in which they can select their purchases to the greatest advantage.

The number of ships, with the amount of tonnage, that have frequented the port, give a better idea of the actual amount of its trade than is afforded by revenue accounts, which must vary with the fiscal regulations of the country, and which exclude altogether goods that enter the port and are re-exported or sent coastwise under bond to other ports in the kingdom. The shipping that cleared outwards to foreign parts in 1753 consisted of—

	Ships.	Tons.
British . . .	1219	153,969
Foreign . . .	150	26,281
	1369	180,250

In 1792 the trade was more than double what it was in 1753. The clearances from the port were in that year—

	Ships.	Tons.
British . . .	1078	310,724
Foreign . . .	504	88,325
	1582	399,049

The shipping belonging to the port in the same year (1792) was—

		Tons.
1109	ships under 200 tons burthen . . .	94,952
368	„ between 200 and 300 tons burthen	91,157
268	„ „ 300 and 500 „	92,970
24	„ „ 500 and 750 „	13,984
1769		293,063
	Indiamen	81,160
	Total tonnage . . .	374,223

The number and tonnage of vessels, British and foreign, that entered the port from foreign parts in each year from 1820 to 1837, will show how greatly its foreign commerce has increased during the last half century:—

Years.	British.		Foreign.		Total.	
	Ships.	Tons.	Ships.	Tons.	Ships.	Tons.
1820	3,354	655,239	856	122,619	4,210	777,858
1821	3,000	585,994	571	89,073	3,571	675,067
1822	3,230	603,167	597	106,099	3,827	709,266
1823	3,031	611,451	865	161,705	3,896	773,156
1824	3,132	607,106	1,643	264,098	4,775	871,204
1825	3,989	785,565	1,743	302,122	5,732	1,087,687
1826	3,495	675,026	1,586	215 254	5,081	890,280
1827	4,012	769,102	1,534	221,008	5,546	990,110
1828	4,084	767,212	1,303	195,929	5,387	963,141
1829	4,108	784,070	1,300	215,605	5,408	999,675
1830	3,910	744,229	1,268	207,500	5,178	951,729
1831	4,140	780,988	1,557	269,159	5,697	1,050,147
1832	3,274	640,057	886	154,514	4,160	794,571
1833	3,421	678,289	1,061	175,883	4,482	854,172
1834	3,786	735,693	1,280	216,063	5,066	951,756
1835	3,780	740,255	1,057	188,893	4,837	929,148
1836	3,845	772,046	1,465	255,875	5,310	1,027,921
1837	4,079	821,788	1,547	240,135	5,626	1,061,923

The number and tonnage of ships that cleared out from London to different parts of the world in each year from 1831 to 1837 have been as follows:—

	1831.		1832.		1833.		1834.		1835.		1836.		1837.	
To the United States of America ...	95	33,026	91	31,603	87	31,403	96	35,206	95	36,771	108	45,027	79	36,231
„ British N. Amer. Colonies...	243	75,905	215	65,016	219	65,753	254	75,693	282	89,089	256	82,578	220	72,060
„ Cape of Good Hope	25	5,012	29	6,131	28	5,638	36	7,097	26	5,242	47	10,291	45	9,867
„ Australian Colonies.........	65	24,008	73	25,964	67	21,502	74	24,576	84	30,056	91	32,202	100	26,464
Other parts........................	4,184	788,174	3,259	722,124	3,383	639,864	3,707	684,479	3,489	667,243	3,906	749,467	4,016	748,300
	4,612	926,125	3,667	850,838	3,784	764,163	4,167	827,051	3,976	828,401	4,408	919,565	4,460	902,922

The above figures exhibit an amount of activity in the prosecution of foreign trade wholly without a parallel, but these numbers are far exceeded by the coasting trade of the port. The number and tonnage of coasting vessels that entered London from other parts of the United Kingdom, distinguishing those engaged in the trade with Ireland, during the six years from 1833 to 1838, were as under:—

Years.	General Coasters, including Colliers.		Irish Traders.		Total.	
	Ships.	Tons.	Ships.	Tons.	Ships.	Tons.
1833	18,242	2,3 8,653	1,094	148,568	19,336	2,517,221
1834	19,026	2,445,895	1,043	147,962	20,069	2,593,857
1835	19,308	2,604,906	1,163	160,076	20,471	2,764,982
1836	19,717	2,656,869	1,048	154,009	20,765	2,810,878
1837	20,201	2,743,854	1,121	167,882	21,322	2,911,726
1838	20,333	2,727,741	1,259	180,435	21,592	2,908,176

It is not possible to form any reasonable estimate of the quantity of merchandise brought by canal and by land-carriage to London or which is by the same means conveyed thence to the interior of the kingdom, but it must be very great. There is not a town or village of any note in the midland districts which does not keep up a constant commercial intercourse with the metropolis by means of boats or waggons or both, but nothing is known concerning the quantity of goods transported. It would be easy for the proprietors of canals to give an account of their traffic, but all information of this kind is systematically withheld, probably through the fear of exciting competition. The value of foreign and colonial produce and merchandise constantly in the warehouses of the great docks is very great, but as no accurate account of the quantities remaining has been taken at any time since the commencement of the warehousing system, it is not possible to give any more definite information on the subject. [DOCKS.]

The amount of postages collected in London in each year om 1832 to 1837 was as follows:—

	£	s.	d.		£	s.	d.
1832	632,696	17	8	1835	664,189	5	2
1833	642,871	0	7	1836	692,509	19	1
1834	660,411	11	4	1837	697,567	5	10

uring this time there has been no increase in the rate of ostage, and the progressive increase in the amount collected probably not more than equivalent to the increase of in-abitants. The above sums form between a fourth and a ird part of the gross produce of the post-office duty in the nited Kingdom. The post communications between Lon-on and various parts of the United Kingdom have been eatly accelerated by means of the different lines of railway ready opened, and as the system is extended, greater im-rovements in this respect will of course be realized. At esent the letter-bags which leave London at eight o'clock the evening arrive at Edinburgh early on the second orning. Letters for Liverpool despatched at the same me are delivered by eleven o'clock the following morning.

Steam-Vessels.—There is no port in the kingdom which as profited more than London through the application of eam to navigation. A great part of the steam-vessels that rrive and depart carry passengers only, and are therefore ot required to make entry at the custom-house, and with egard to such as carry goods no distinction is made at the ustom-house between them and sailing-vessels, for which easons no accurate account of the number of this class of ips that enter and leave the port can be given. Steam assage-boats are passing and repassing at all hours during e day between London and Greenwich and Woolwich, nd others start every quarter of an hour during the day om London Bridge and Westminster. To Gravesend oats go at various times during the day, and in the summer ere are several departures and arrivals every day to and om Margate and Ramsgate. Between London and Calais, oulogne, Antwerp, and Rotterdam steam-vessels are pass-ng almost daily in summer and frequently in winter. With arious ports in England, Scotland, and Ireland, a constant tercourse is kept up in the same manner.

LONDON CLAY. The most considerable of the ter-ary formations of Great Britain is thus designated, from s development in the valley of the Thames under and round the metropolis. It may be viewed in three parts, ccupying the following series:—

Upper part.—'Bagshot Sand,' in which several remarkable fishes have been lately noticed by Dr. Buckland.

Middle part, 'London Clay.'—Containing a few bands of sand, nodules of septaria, and multitudes of marine shells.

Lower part, 'Plastic Clays and Sands.'—Various coloured clays and sands, with lignite, and marine, æstuary, and fresh-water shells.

LONDON, NEW. [CONNECTICUT.]

LONDONDERRY, a maritime county of the province f Ulster in Ireland, bounded on the north by the Atlantic Ocean, on the east by the county of Antrim and a portion of Loch Neagh, on the south by the county of Tyrone, and on the west by the county of Donegal. According to the map of Ireland published under the superintendence of the Society for the Diffusion of Useful Knowledge, it lies between 54° 38′ and 55° 22′ N. lat., and between 6° 28′ and 7° 24′ W. long.; and, according to the map of the Ordnance Survey of Ireland, extends from the Tyrone boundary at New Bridge on the Ballinderry river on the south to Portrush on the north, 40½ statute miles; and from the Donegal boundary near Londonderry on the west, to the Antrim boundary at Kilrea Bridge on the east, 34 statute miles. The area, according to the same map, consists of—

	Acres.	r.	p.
Land	507,997	1	27
Water	10,404	0	3
	518,401	1	30

or 810 square statute miles. In 1831 the gross population was 222,012.

The county is of an irregularly triangular area, of which the eastern side may be considered as formed by the shore of Loch Neagh and the line of the river Bann, the south-western by the Tyrone boundary, and the north-western by the river Foyle and coast-line. From the Bann the surface gradually rises westward for about ten miles, forming a chain of elevations which bound the valley of that river on the west, and constitute the most remarkable feature of the interior of the county. These heights slope with a gentle declivity eastward and northward, but present steep and often precipitous escarpments towards the west, in which direction they overlook an extensive tract of undulating country extending from their bases to the eastern shore of Loch Foyle, and bounded on the south by the mountain range which separates the counties of Londonderry and Tyrone. Between the southern extremity of the first-mentioned range and the shore of Loch Neagh a comparatively level tract is interposed. The country between the rivers Bann and Foyle may thus be conveniently considered as divided into the district of the Bann, the district of Loch Foyle, and the district of Loch Neagh.

The Lower Bann, from Loch Neagh to the sea, a distance of upwards of thirty miles, has a fall of only 48 feet. The sea flows up to the Cutts above Coleraine, a distance of six miles, between low banks, which are encumbered towards the mouth of the river with extensive tracts of sand. The north-eastern liberties of Coleraine here occupy an irregular semicircle of about four miles in radius, surrounding the town [COLERAINE] on the eastern side of the river. The general characteristics of this district are similar to those of the north coast of the county of Antrim. The elevations are however inconsiderable, and the general aspect of the country is tame and bleak. On a low rocky peninsula at the extreme north-east of the county is the thriving town of Portrush; and nearer the Bann, on an exposed strand running down between low headlands of basalt is Port Stewart, a well built and fashionable watering-place, but quite unprovided with shelter for any craft above the size of a fishing-boat. West of the sand-banks which occur at the embouchure of the Bann the coast has a bolder outline, rising in a series of precipitous cliffs over the sandy beach. These cliffs extend a distance of rather more than two miles, increasing in height as they trend westward, until at the north-western extremity of the basaltic tract, of which they form the northern boundary, they have an elevation of from 360 to 400 feet. At this point the escarpments which mark the western boundary of the basaltic area commence, and may be traced along the brows of all the heights which have been mentioned as overlooking the district extending from this line to Loch Foyle. Of these heights the most prominent are Benyevenagh, at the northern extremity of the range, which rises abruptly over the sandy flat of Magilligan to a height of 1260 feet; Donald's Hill, nine miles farther south, 1315 feet; Benbradagh, three miles south of Donald's Hill, 1531 feet; and, separated from Benbradagh by the bold amphitheatrical valley of Glenshane, the upper or eastern boundary of which is formed by Carntogher mountain, 1521 feet high, is Craignashock, 1773 feet, with its subordinate heights of Altæglish, 1261 feet, and Tamniarin, 1272 feet, which together form the south-western extremity of the basaltic area, and complete a nearly continuous range of mountain of 24 miles in length from north to south. With the exception of some small streams which form striking cascades in falling over the escarpments of Avish and other minor heights north of Benyevenagh, all the waters which rise in the area included between the western fronts of the above-mentioned mountains and the river Bann take their course in the direction of the latter river. Of these the most considerable are the Macosquin and Agivey rivers, the former of which has its sources in the *slack*, as mountain-passes are here provincially termed, between the mountains of Benyevenagh and Keady, and the latter of which unites the waters of several streams descending from the range of Donald's Hill and Benbradagh. On the road leading from Kilrea on the Bann, westward through the *slack* separating the Donald's-hill range from the group of Benbradagh and the other mountains, which on this side form the valley of Glenuller, is the town of Garvagh. The Clady river, rising from the eastern declivities of Carntogher mountain, also joins the Bann at Portglenone, a point of considerable intercourse between the counties of Londonderry and Antrim. South of this the drainage of the county is towards Loch Neagh, through the rivers Mayola and Ballinderry, the latter of which forms part of the county boundary on this side. The Mayola has its rise at the bases of the mountain groups which form the head of Glenshane and the valley of Ballynascreen, and carries a considerable body of water to Loch Neagh, which it enters at its north-western extremity. The town

Maghera is situated about midway between the Clady and Mayola rivers, on the road westward from Toome, at which latter place the Lower Bann first issues from the lake. The towns of Castle Dawson, Magherafelt, Tobermore, and Moneymore are situated in the open country between the Moyola and the Ballinderry rivers. This tract is bounded westward by the detached mountain of Slieve Gallion, which rises to the height of 1730 feet, and is in its structure similar to the mountains of the basaltic tract abovementioned, although throughout the wide intervening valley of Ballynascreen there are no traces of any connecting formation. West of the valley of Ballynascreen commences a mountain-chain which with little interruption extends to the valley of the river Foyle, forming the boundary between the counties of Tyrone and Londonderry. The highest of the group is Sawell, which rises to a height of 2236 feet, about midway between Slieve Gallion and the western extremity of the chain. The other chief heights on the range are Muinard, east of Sawell, 2057 feet; Dairt mountain, west of Sawell, 2037 feet; Finglen, east of Muinard, 1875 feet; and Slieve Kirk, which forms the western extrèmity of the range, 1224 feet. The district included between these mountains and Loch Foyle, constituting the western division of the county, is divided by a central tract of high land into the valleys of the rivers Roe and Faughan. The former, rising in the upper part of Glenshane, is joined by the Owenreagh and Owenbeg rivers at the entrance of that valley, from which it pursues a northern course nearly parallel to the line of abrupt declities terminating the basaltic region, to Loch Foyle, which it enters by a sharp turn to the west immediately under the base of Benyevenagh. Several streams join the Roe from the comparatively level tract interposed between it and these mountains, rendering it, next to the Foyle and Bann, the most considerable river of the county. The valley of the Roe, especially towards the embouchure of the river, is flat and open, and contains much good and highly improved land. The thriving town of Newtown Limavady is situated on this river about five miles above its mouth, on the high road between Coleraine and Londonderry city, next to which places it is the most important town of the county. Dungiven, also a place of some consequence, occupies a romantic site on the same river near its junction with the Owenreagh, in the opening of the valley of Glenshane. The principal roads from the east to the west of the county pass through these towns, which severally occupy points at which the leading mountain-passes converge. The open rich country of this valley, called Moyroe, or the plain of the Roe, extends westward along the southern shore of Loch Foyle by Muff, and at the lower extremity of the loch opens into the valley of the Faughan. The Faughan river, which springs from the northern declivities of Sawell, after skirting the bases of the several mountains which extend from that point westward and northward to within two miles of the Foyle, makes a sharp turn to the east of north, and runs through a highly improved open valley to Loch Foyle. From the village of Claudy, situated near the sources of the Faughan, to the point where the river turns northward, a distance of twelve miles, the valley is occupied by well-improved grounds and numerous bleach-greens. The fertile vales of Bond's Glen and Glenrandle open from between the mountains forming the county boundary on this portion of the valley of the Faughan. The district between the valleys of the Roe and Faughan is considerably encumbered with moor and mountain. Legavannon, the principal eminence, which occupies nearly the centre of the tract, has an elevation of 1269 feet. Other heights, varying from 600 to 900 feet, spreading southward and westward from Legavannon, form the valleys of Burntolloght and Faure, from each of which a considerable stream descends to the Faughan.

Between the Lower Faughan and the Foyle is a range of undulating ground crossed by a valley through which the high road from Dungiven is carried to the village of Waterside; from thence a wooden bridge completes the communication with Londonderry city. The city of Londonderry occupies a boldly rising ground on the west bank of the Foyle, along which the county embraces an irregular tract extending from about four miles above the city to a mile below Culmore, where the river expands into Loch Foyle. The distance from end to end of this out-lying portion of the county is ten miles, and its breadth from one to three and a half. It is all arable and in a good state of improvement, as is also the opposite bank of the river. The Foyle here makes a noble appearance, varying in breadth from 300 yards to half a mile, and being capable of floating ships of 800 tons up to the bridge of Londonderry.

The most remarkable feature of the coast-line is the tract which extends from the north-western extremity of the hilly region to the low point of Magilligan and southward to the mouth of the Roe. On this tract is measured the base-line of the trigonometrical survey of Ireland now going on under the superintendence of the Ordnance, 53,200 feet in length. The same tract appears to occupy the greater portion of the bottom of the loch, and rises towards its centre in a bank which confines the navigation to that portion of Loch Foyle lying along the coast of Donegal. The length of the loch, which is of a triangular shape, bounded by the low coast of Londonderry on the east and south, and by the bold shore of Ennishowen on the west, is above 18 miles, and its greatest breadth 10 . The entrance to the loch, between Magilligan Point and Ennishowen Head, is about a mile across, and from this point to Londonderry city is a safe and tolerably sheltered navigation of 23 miles. Eastward of the entrance is a shoal called the 'Tuns,' which renders the loch difficult of access in stormy weather. The safer channel is by the western side of this shoal. Except the small and at present inconvenient harbour of Portrush, there is no other shelter for vessels on the coast of this county. It has been proposed to render the Bann navigable from Loch Neagh to the sea by deepening the channel at Toome, and clearing away the ledges of rock which cross it at Moyvannagher, Portna, and the Cutts. There is however an extensive sand-bar at the mouth of the river, which could not be kept open without constant dredging. Under these circumstances Portrush is likely to continue the port of Coleraine.

The roads throughout the county are in general excellent. The immediate valley of the Bann and the district of Loch Neagh in particular are closely intersected with lines of communication. The western district is not so well opened. The chief lines here are those connecting Newtown Limavady by the southern shore of Loch Foyle and the valley of the Lower Faughan with Londonderry, and that which runs by the Upper Faughan from Dungiven to the same place. One road only crosses the rough country interposed between these lines. The valley of the Roe is well provided with roads, which extend southward by Banagher to Clady, giving ample means of communication to the country between the heads of the rivers Roe and Faughan. The communication southward is chiefly by the valley of the Foyle on one side, and by the head of the valley of Ballinascreen on the other. Besides these there are several passes from Tyrone into Londonderry among the mountain groups which lie between these points.

By a rain-guage, kept with great care at Londonderry, it appears that the maximum annual quantity of rain, on an observation of seven years, was somewhat less than 35 inches, the minimum somewhat less than 26 inches, and the mean 31·1 inches. From the same observations it appeared that on an average of seven years there were in each year 129 days fair, 202 showery, and 34 wet. The climate is by no means favourable to early sowing. The frequency of the showers, rather than the quantity of rain, renders the air more humid than in many districts where a greater quantity of rain falls.

Geology.—The basaltic tract corresponds in all respects to the remainder of the field on the opposite side of the Bann [Giants' Causeway], with this remarkable difference, that the dip of the strata is reversed; the surface, and the masses which compose it, on the Londonderry side of the Bann dipping towards the north-east, whereas their direction on the Antrim side is nearly to the south-west. The basalt, as in Antrim, attains its greatest thickness at the northern extremity of the field, the cap of Benyevenagh measuring upwards of 900 feet. Chalk, lias, limestone, and red sandstone, succeed in descending order, one or more of the members being frequently absent, and constitute the remainder of the system, which throughout reposes immediately on the primitive rock. The geological structure of the district may thus be described as a floor of primitive rock overlaid in part by a field of secondary formations, capped by basalt. The boundary line is marked by the abrupt declivities forming the eastern limit of the valley of the Roe: from the southern extremity of this ge it passes across the Mayola river to the east of Slieve llion, and so to Loch Neagh, on the opposite side of ich it reappears at the mouth of the Glenavy river. The in constituent of the rest of the county is mica slate. is rock covers about 450 square statute miles of the rface of Londonderry. In general the line of demarca- n between it and the red sandstone, which is the most ominent member of the secondary field, is well defined. e mass however, that of Coolcoscraban mountain, which es nearly 1300 feet above the level of the sea, is wholly mposed of this rock, although almost surrounded by the vanced basaltic heights of Craignashock and Benbradagh. wards of two-thirds of the mica slate of this district long to the talcose variety. Primitive limestone is of fre- ent occurrence throughout this field. At a height of 800 t above the sea, on the north-west side of Carntogher ountain, it is found with veins of coloured spar, quartz, d green chlorite. It also occurs near Dungiven and audy. On the east side of Slieve Gallion there is a gran- ar limestone, which contains quantities of crystallized rnblende: hornblende slate is found at several places in e valley of the Roe; a bed, four hundred yards in extent, curs near the old church of Dungiven, where it runs rallel to the bed of primitive limestone above mentioned. he structure of the south-eastern extremity of the county more complex. Slieve Gallion, besides having a cap of salt, with the usual underlying formations, exhibits wards its base beds of sienite in connection with por- yry. On the north-west side the sienite verges into green- ne. Several masses of greenstone, unconnected with the bular basalt of the summit, also crop out on the east side the mountain. All along the western verge of the saltic region the red sandstone, which forms the lowest mber of the field, projects beyond the superior strata in elt varying from one to two miles in breadth. This is e surface rock of the eastern valley of the Roe, from the ad of which it sweeps across the opening of the valley of llinderry, and so between Slieve Gallion and the line of salt into Tyrone. A detached patch of floetz limestone curs near the outer edge of the sandstone field at Desart- artin, on the north-east of Slieve Gallion, where it is worked r burning. There are no mines worked in this county.

Soil, Agriculture, and Trade.—The soil of that part of e valley of the Bann where the subsoil is hard basalt nsists for the most part of a rusty loose grit, without fficient strength or cohesion for wheat crops. Numerous acts of bog, interspersed with shallow pools, and frequently parated by craggy knolls of basalt, are scattered over this rt of the county. There are however tracts of good land ong the banks of the several rivers which traverse the strict, and especially at their junctions. In general these perior portions consist of rolled gravel banks: clayey acts occur in the neighbourhood of Coleraine, beyond hich, on the Antrim side of the river, the basaltic soil is a better quality than in the rest of the tract. The same aracteristics mark the basaltic field in the district of och Neagh; but between the basalt and the primitive istrict farther west is a tract of rich open country, ex- nding southward into Tyrone. This is the most extensive act of good ground in the county. The soil of the basaltic eld towards its western border is of a better description han in the immediate valley of the Bann and Loch eagh. The basalt is here copiously intermixed with eolite, which renders its detritus comparatively fertile. A oil of this kind covers the summits of Benyevenagh and enbradagh, forming extensive tracts of sweet pasture. he subjacent valley of the Roe possesses a variety of soils, ll of a superior kind. The rich flat of Moyroe, extend- ng from the base of Benyevenagh across the opening of he valley, consists of alluvial deposits, which form a deep amy soil of considerable strength and fertility. A strip f loamy land, also of alluvial origin, accompanies the indings of the river as high as Newtown Limavady. igh gravel banks, rising in a natural terrace on each side eyond these flats, mark the more immediate valley of the iver throughout the greater part of its course. The soil of hese banks is generally a fertile though not very rich loam. eyond the eastern terrace commences a tract of red clay, rising from the decomposition of the sandstone, which at his side forms the surface-rock up to the immediate acclivi- ies of the mountains. This clay contains extensive beds f marl, and with good treatment bears excellent grain crops. he schistose district, lying between the valleys of the Roe nd Faughan, is to a great extent moory and mountainous. The valleys of Faughan-vale and Muff-glen, running southward from the open tract along the margin of Loch Foyle into the schistose region, have good tracts of fertile land, composed of a mixture of gravel, loam, and strong clay. The main valley of the Faughan river is in its structure and soil similar to the western half of the valley of the Roe, having gravel terraces reaching back to the schistose region at each side. These are well cultivated, and towards the lower part of the valley spread over a considerable tract. Gravel and mica-slate are also the chief constituents of the soil on the opposite bank of the Foyle. A cold blue clay occurs here in a few detached spots. The best improved portions of the county are the district of Loch Neagh, the valley of the Roe, the valley of the Faughan, including the coast of Loch Foyle, between the embouchures of these rivers, and the immediate vicinity of Londonderry on both sides of the Foyle. There is a very general scarcity of timber. The chief mansion-house in the county is that of Down-hill, the residence of Sir James Bruce, Bart., built by the late earl of Bristol, bishop of Derry. It is an imposing architectural pile, situated on the brow of the basaltic field where it rises over the sea, about a mile and a half west of the mouth of the Bann. The cliffs immediately behind the house rise upwards of 100 feet above the beach, and the situation is so bleak that planting could only be effected in the deep ravines which surround the demesne on the landward side. There is here a splendid collection of paintings by the old masters, and of other articles of virtù, removed from the galleries at Ballyscullion when the palace erected by the same prelate there was taken down. Ballyscullion-house, as it stood in 1802, was by much the most magnificent residence in the north of Ireland. The situation, on the bare flat near the point where the Bann issues from Loch Beg, was however extremely unfavourable to the formation of a demesne corresponding to the magnificence of the building. The house was accordingly taken down on the death of the earl, and the materials sold.

The progress of agriculture in this county has been materially forwarded by the establishment of an agricultural school near Muff by the company of grocers of London, who here hold large estates under the crown. There are 130 acres of land attached to the school, for experimental farming; a classical school is likewise connected with the establishment. Oats and barley are the principal grain crops. The system of greencropping is practised by the gentry only. There is but little land in pasture, and the breed of cattle, with the exception of pigs, of which great numbers are reared, is in general not much attended to. The following table exhibits the quantity of grain sold at the chief market-towns, exclusive of Londonderry and Coleraine, in the years 1830 and 1835:—

	Wheat. (tons.)		Oats. (tons)		Barley. (tons.)		Bere. (tons.)	
	1830.	1835.	1830.	1835.	1830.	1835.	1830	1835.
Newtown Limavady	1,113	926	2,227	1,853	..	..	1,113	926
Dungiven	371	308	742	617	..	..	371	308
Garvagh	..	..	340	330	..	..	..	..
Maghera	..	..	690	616	114	17	..	..
Moneymore	47	68	214	251	4	54	..	..
Kilrea	..	30	..	300	..	..	..	..
Magherafelt	300	1,000	1,200	700	..	..	..	..

The condition of the labouring population is superior to that of the same class in most parts of the north of Ireland. The general rate of wages for agricultural labourers is 1*s*. per day for 180 working days in the year. The population are to a considerable extent of Scottish and English descent. Their dwellings and persons are distinguished by a superior air of comfort. Those of the native race occupy the more mountainous and remote districts: they are a simple and interesting people, preserving vivid traditions of early times, and are generally on the most friendly terms with the rest of the population. The Irish language is very commonly in use among them.

The manufacture and bleaching of linens is the staple trade of the county. The most extensive bleach-greens lie along the rivers Roe and Faughan, on the latter of which there is abundant water-power and numerous sites admirably calculated for this branch of the manufacture. In 1831 there were in the county 2543 weavers, 46 reedmakers, 258 flax-dressers, 21 bleachers, 64 cotton-spinners, 3 brewers, 1 distiller, 6 maltsters, 153 coopers, 53 hatters and hosiers, 50 millers, 24 corn-dealers, 18 millwrights, 25 tanners, and 18 tobacconists. The export and import trade of the county is carried on at the ports of Londonderry city and Portrush, the latter being the seaport of Coleraine. The exports of Londonderry city in 1835, including 20,802 tons of corn, meal, and flour, amounted in value to 1,040,918*l.*, and the imports to 708,054*l.* [Londonderry, *City*.] The exports of Coleraine and Portrush in the same year amounted to a value of 105,685*l.*, and the imports to 65,900*l.* The quantity of corn meal and flour included in the exports of the latter port in that year was 5137 tons.

Divisions, Towns, &c.—Londonderry is divided into the half barony of *Coleraine*, on the N.E., the barony of *Kenaught*, in the E. and centre, containing the towns of Newtown Limavady (pop. 2428) and Dungiven (pop. 1163), and the village of Ballykelly (pop. 290); *Loughinshelin*, on the S.E., containing part of the town of Moneymore (total pop. 1025), and the towns of Magherafelt (pop. 1436), Kilrea (pop. 1215), Maghera (pop. 1154), Tobermore (pop. 679), Castle Dawson (pop. 674); and *Tyrkerin*, on the W., containing the villages of Muff (pop. 192), Claudy (pop. 180), and Faughanvale (pop. 123). Besides these, there are within the county the liberties of Coleraine, containing the town of Coleraine (pop. 5752) and the village of Portstewart (pop. 475); and the liberties of Londonderry, containing the city of Londonderry (pop. with its suburbs, 19,620).

Coleraine was incorporated by charter of 28th June, 11 James I. The common-council, including the mayor, are the governing body. The corporate authorities have jurisdiction within the borough, similar to that of the lord-mayor and aldermen of London, but the court is now fallen into disuse. Their revenue arises from rents averaging 418*l.* 18*s.* 6*d.* per annum, and tolls averaging 314*l.* 0*s.* 4½*d.* per annum, which income was chiefly applied in 1835 to the reduction of a debt amounting to 1500*l.* The marquis of Waterford is the patron of the borough. Coleraine is now the seat of a most flourishing linen manufacture. [Coleraine.]

Newtown Limavady was incorporated by charter of 30th March, 11 James I. The corporation is now extinct. The town is remarkably well built, and has a very cheerful appearance. There is a handsome sessions-house; but the market-house is old and inconvenient. It is a place of considerable trade in grain, and is the centre of an extensive linen-bleaching district. The surrounding scenery is highly beautiful.

Magherafelt is also a handsome though small town. It consists of a spacious square with the market-house in the centre, from which the four principal streets diverge. The houses are stone-built and slated. There is a great market for linens and yarns once a fortnight. The linen manufacture is carried on extensively in the vicinity: there are also large brewing and distilling establishments in the town.

Portrush, in consequence of the recent improvements in the harbour, is rapidly rising into importance. Steam-boats ply regularly from hence to Liverpool, Glasgow, and Londonderry. Dungiven is the emporium for the whole of the mountainous district round the sources of the Roe and Faughan. It had formerly a considerable manufacture of linens, but it has latterly fallen off. It has more the air of a rural village than the other towns, and is, from its secluded situation and the primitive manners of the people of the vicinity, a place of peculiar interest.

Prior to the Union, Londonderry sent eight representatives to the Irish parliament, viz. two for the county, two for the city, and two for each of the boroughs of Newtown Limavady, and Coleraine. The representation is now confined to two county members, one member for the city, and one for the borough of Coleraine. In October, 1836, the county constituency consisted of 2331 electors. The assizes are held at Londonderry, and quarter-sessions at Newtown Limavady, Magherafelt, and Coleraine. The police-force of the county, on the 1st January, 1836, consisted of four chief constables, 15 constables, 77 subconstables, and 5 horse, the cost of maintaining which establishment amounted to 3954*l.* 15*s.* 9*d.*, of which 1855*l.* 12*s.* was chargeable against the county. This is the smallest police-force employed in any county of Ireland. The total number of persons charged with criminal offences, who were committed to the county gaol in 1836, was 363, of whom 300 were males and 63 were females. Of these, 125 males and 4 females could read and write at the time of their committal, 112 males and 31 females could read only, and 63 males and 28 females could neither read nor write. The district lunatic asylum for the counties of Londonderry, Donegal, and Tyrone is at Londonderry city, which also contains the county infirmary. There are dispensaries in all the principal towns and villages.

pulation.

Date.	How ascertained.	Houses.	Families.	Families chiefly employed in agriculture.	Families chiefly employed in trade, manufactures, and handicraft.	Families not included in the preceding classes.	Males.	Females.	Total.
1792	Estimated by Dr. Beaufort .	25,007	..	..	..	..	..	..	125,000
1813	Under Act of 1812 . . .	31,287	..	..	..	..	..	..	186,181
1821	Under Act 55 Geo. III. c. 120	34,691	37,557	..	..	..	92,979	100,890	193,869
1831	Under Act 1 Will. IV. c. 19	39,077	41,239	25,009	10,393	5,837	106,657	115,355	222,012

History.—Of the early history of Londonderry county, pending the publication of the 'Ordnance Memoir,' little can be said, although ample materials exist in the native Irish annals similar to those made available in the published 'Memoir of Londonderry City.' At the most remote period it appears to have been possessed by the septs of O'Loughlin and O'Neill, to whom the tribe of O'Cahan, who held the eastern and central districts, was tributary. The antient fortress of Aileach [Donegal] was the seat of the first family, who were of the elder and royal branch of the O'Neills. The O'Cahans' chief places of residence were, first at Dunseverick, the antient Dunsobarky, in the present county of Antrim, and afterwards at the 'Dog's Leap,' or Limavady, on the Roe. Soon after the arrival of the English in 1197, John de Courcy marched with a considerable force from Downpatrick to Coleraine, where he erected the castle of Mount Sandal, close to the Cutts' fall, and afterwards, crossing the river, plundered the country of O'Cahan. Peytoun, the English commander, who was left by De Courcy in the newly-built castle, was soon after cut off with his entire force near Faughan-vale, on a predatory excursion. Next year De Courcy again invaded the country of O'Cahan, and proceeded to Derry, which he seized; but Hugh O'Neill, of Tyrone, having made a descent on the Antrim coast at Larne, and routed the English there, compelled him to abandon his conquest. The establishment of an English garrison at Coleraine would appear to have enabled the English very soon after to reduce at least the eastern and central parts of the county into shire-ground, for by various records of the reigns of Edward I. and Edward II. grants appear to have been made and inquisitions to have been taken in Derry in the regular manner, and in the patent roll of the 20th Edward II. is an entry of the appointment of Robert Savage to be sheriff of the county of Coulrath, or Coleraine, as O'Cahan's country was then called. It is probable that the English law continued in force in the eastern parts of the county until the great revolt of the O'Neills in 1333. [Belfast.] After that period the native Irish continued undisturbed masters of the country until the middle of the sixteenth century, when the rebellion of Shane O'Neill, A.D. 1566, made it necessary to send a force to Derry. Seven companies of foot and a troop of horse were despatched by sea under Captain Randolf, and encamped at Derry in October of that year. An engagement ensued, in which O'Neill was defeated; but Randolf being slain, and an explosion of gunpowder having destroyed the works of the English, the place was soon after abandoned. In the year 1600, Sir Henry Dockura, with a force of 4000 foot and 200 horse, arrived in the river Foyle, and immediately commenced the construction of three forts, one on the western bank of the Foyle at Culmore, where the river opens into Loch Foyle, one on the hill of Derry, and one at Dunnalong, a little higher up on the eastern bank of the river. This was the first commencement of a permanent settlement. The rebellion of Sir Cahir O'Dogherty in 1608, and the flight of Tyrone and O'Donnell in the preceding year, left the entire of this and five other counties at the disposal of the crown. On the 28th January, 1609, negotiations were commenced between the king and the corporation of London for the purpose of settling the terms on which the forfeited lands in this county should be conveyed to the latter for the purpose of planting them with Protestant colonists. It was at first agreed that the Londoners should spend 20,000*l.* on the plantation, in consideration of which the king granted to them the old county and town of Coleraine, with the woods of Glanconkene and Killeightra, and the town and liberties of Derry, excepting the church lands. For the management of these estates, the common-council elected a body of twenty-six, consisting of a governor, deputy-governor, and assistants, of whom one-half retire every year, their places being supplied by a new election.

In 1619 this body was incorporated by royal charter, and their estates erected into one county, to be called the county of Londonderry. The corporation, which is generally known as 'The Irish Society,' still exists as constituted under the charter granted by Charles II. after the Restoration. The division of the county took place immediately after the granting of the first charter. To the company of Goldsmiths were assigned the south-eastern liberties of Derry; the company of Grocers had the precinct of Muff; the Fishmongers, Ballykelly; the Ironmongers, Aghadowey; the Mercers, Moyvanaway; the Merchant Taylors, Moycosquin; the Haberdashers, Booevagh; the Clothworkers, part of Coleraine; the Skinners, Dungiven; the Vintners, Bellaghy; the Drapers, Moneymore; and the Salters, Magherafelt. Of these twelve companies, the Goldsmiths, Haberdashers, Vintners, and Merchant Tailors have from time to time disposed of their proportions in perpetuity. The chief proprietors so introduced are the families of Beresford, Richardson, Ponsonby, Alexander, and Conolly. Of the remaining eight companies, five have under-leased their lands, and the remaining three, namely, the Drapers, Mercers, and Grocers, retain their estates in their own hands, which they manage by resident agents. The lands not assigned to the companies still belong to the Society. The introduction of the new colony changed the entire face of the country, which, up to this period, had been one of the most desolate tracts in Ireland. Artisans, in all the chief branches of trade and manufacture, were brought over by the companies, and habits of industry and independence became at once fixed among the population. The native Irish, returning by degrees, have again increased so far as nearly to equal the descendants of the settlers in number. Although a peaceable and interesting people, they are however still far behind the rest of the population in those habits which conduce to prosperity and comfort.

There are some remains of a Cyclopean fortress at the Giant's Sconce, on the road from Newtown Limavady to Coleraine. Dungorkin, a circular mount surrounded by a wet ditch, near Claudy, is the most remarkable of the numerous earthen fortresses which occur throughout this, as throughout every other Irish county. There are several cromlechs, and other supposed druidical remains, of which the largest is at Slaught-Manus. Artificial caves and tumuli are frequent. Of military edifices the only remaining are the castles of Killoloo, Dungiven, Salterstown, and Muff, erected by the Londoners. The old abbey of Dungiven, which occupies a romantic site on a rock rising 200 feet above the bed of the river Roe, is the most interesting ecclesiastical ruin in the county. It was built A.D. 1100 by O'Cahan, and contains several well-sculptured monuments of that family. The old church of Banagher, in the same neighbourhood, is also a very interesting ruin. Farther down on the Roe is the site of O'Cahan's castle, finely situated on a rock over the river, and surrounded by woods.

The county expenses are defrayed by grand-jury presentments. The amount levied in 1835 was 23,996*l.* 16*s.* 1*d.*, of which 9221*l.* 8*s.* 10*d.* was for roads and bridges, 8702*l.* 11*s.* 10*d.* was for buildings, charities, salaries, &c., and 2056*l.* 17*s.* 6*d.* was for police. For the educational statistics of the county see DERRY diocese.

(*Statistical Survey of Londonderry*, Dublin, 1802; *Memoir of the Chart and Survey of Londonderry*, by the Rev. George V. Sampson, London, 1814; *Transactions of the Geological Society*, vol. iii.; *Concise View of the Irish Society; Ordnance Memoir of Londonderry City*, Dublin 1837: Cox's *History of Ireland; Parliamentary Reports and Papers*, &c.)

LONDONDERRY, a city in the barony of Tyrkerin and county of Londonderry, in 54° 49′ N. lat. and 7° 19′ W. long., on the west bank of the river Foyle, five miles above the point where that river spreads into the harbour of Loch Foyle, and 144 statute miles from Dublin by the present mail-coach roads.

The municipal boundary, by which the jurisdiction of the corporation is virtually limited, includes an irregular area of 37,714 acres, of which 12,615 are on the west and 19,098 acres are on the east side of the Foyle. These limits are considerably restricted by the boundary adopted for parliamentary representation. The site of the city within the walls measures 1273 feet by 635 feet. The area of the hill on which the old town stands is nearly 200 acres.

Derry, antiently called Derry-Calgach, first became a place of note in consequence of the foundation of a monastery there, about A.D. 546, by Columba, the celebrated apostle of the Picts. It is probable that before this time the place had been consecrated to religious purposes, as the oak-grove, which originally covered the hill, and from which it takes its name, continued to be regarded as a sanctified spot for many ages. A small town soon grew up about this church, which stood on the declivity of the hill towards the south-west. Its whole early history consists of the record of successive burnings and pillagings by the neighbouring Irish and by the Danes. In 1162 eighty houses which had encroached on the old Abbey Church were pulled down, and an area was enclosed round the building. A new church, called the Temple More, or great church, was built in the next year by the assistance of Murtagh O'Loughlin, king of Ireland. Derry does not appear to have been a place of any military strength at this time, as it fell an easy prey to the English under De Courcy in 1198. [LONDONDERRY, *County*.] In 1311 King Edward II. granted the town of Derrycolumbkill, as it was then called, to Richard de Burgho; but the great rebellion of the succeeding reign rendered this grant ineffectual until after the inheritance had returned to the crown in the person of King Henry VII. On Sir Henry Dockura arriving here, in 1600, he describes it as 'a place in maner of an iland, comprehending within it forty acres of ground, wherein were the ruins of an old abbay, of a bishopp's house, of two churches, and at one of the ends of it an old castle, the river called Loughfoyle compassing it all on one side, and a bogg, most comonlie wett, and not easilie passable except at two or three places, dividing it from the maine land.' Here the English immediately commenced the construction of a fort, which appears to have occupied the north-eastern declivity of the hill, containing within it a considerable town, and having a straggling suburb reaching from the gate to the river side, where there was a castle for the protection of the wharf. This fort and town were for the most part burned down in the rebellion of Sir Cahir O'Dogherty in 1608, and on the London Companies obtaining their grant in 1613, a more extended plan was adopted for their reconstruction. The new fortress was made to embrace the entire crest of the hill, and was surrounded with a strong wall and rampart protected by seven bastions and three demi-bastions. The four principal streets, leading from as many gates in the several sides of the parallelogram, were laid out at right angles, a handsome square for the corporation-house being left in the centre. The progress of the city was now rapid. In 1622 the town-house was erected. Up to the year 1629 the total expenditure of the London companies in building and fortifying the walls, erecting houses, constructing quays and wharfs, and making roads, was 27,197*l.* In 1633 the cathedral was completed at a further cost of 4000*l.* The cancelling of the company's charter in 1637, and the subsequent breaking out of the great rebellion, put a stop to these improvements. The city now became an asylum for the distressed Protestants of the counties of Londonderry, Tyrone, and Donegal. In 1649 the city was garrisoned for the parliament by Sir Charles Coote, who endured a siege of four months by the royalists under Sir Robert Stewart. The defeat of the Roman Catholic forces under Bishop MacMahon at Skirfolas in Donegal, the following year, left the parliamentarians in peaceable possession until the conclusion of those troubles, for the time, by the restoration of King Charles II. In consideration of the services of the citizens, their charter was renewed by letters patent of the 6th April, 1662, and the city again began to prosper. About 1685 however a great decay took place in trade and commerce, and two years after, on a *quo warranto* brought against the corporation by the government of King James II., the corporation were deprived of their charter. The subsequent proceedings of the government excited universal alarm among the Protestants of Ireland, and a report of an intended massacre having reached the city in the latter end of the year 1688, decided the inhabitants on refusing admission to Lord Antrim's regiment, which had been despatched by the lord-lieutenant Tyrconnell to garrison the place. The gates were closed by some resolute young men of the town, on the 7th of December, just as the advanced guard of the king's forces appeared on the opposite side of the river. The northern Protestants now generally took arms, and Derry became their principal rendezvous. Lord Mountjoy, a Protestant nobleman, holding a commission in the army of King James, was, with some difficulty, admitted by the citizens, who stipulated that one-half of any force he might introduce should be Protestants, and that until their apprehensions should be allayed by a pardon for the late commotion, the citizens themselves should keep the guards. In the meantime arms and ammunition were provided, and applications for assistance urged on the London companies. Lord Mountjoy being despatched to Paris, the command was bestowed on Colonel Lundy, who professed himself strongly attached to the Protestant cause.

On the 12th March, 1690, King James landed at Kinsale, and immediately proceeded to Dublin, where it was resolved to make the reduction of Derry the object of the army's first operations. On the approach of King James, who proceeded on the expedition in person at the head of 20,000 men, Lundy declared the place untenable, and dissuaded some English forces which had just arrived in the bay from landing in the face of the superior force advancing against them. The citizens, indignant at his cowardice, rose tumultuously, seized the gates, and fired upon the advanced guard of the Irish. Lundy having fled from the city in disguise, the citizens elected two new governors, Walker, rector of Donoghmore, and Major Baker, and formed themselves into eight regiments, amounting to 7020 men and 41 officers. Eighteen clergymen of the establishment and seven dissenting ministers, laying aside all sectarian animosities, joined their ranks. The besiegers having seized the fort of Culmore, erected batteries on both sides of the river, and stretched a boom across for the purpose of preventing the arrival of supplies. They then proceeded in their operations against the city by regular approaches on the western side, and pushed some of their works close to the foot of the rampart. The citizens conducted their defence by a vigorous fire from the walls, and by irregular sallies, which were generally attended with success. After the first eleven days of the siege, King James withdrew, leaving the command to Marshal Rosen. On the 30th July, after the inhabitants had been reduced to the necessity of eating dogs, horseflesh, hides, and tallow, and when even these were failing, two ships laden with provisions and convoyed by an English frigate entered the bay. The foremost victualling ship, after passing Culmore and the batteries on either side uninjured, struck the boom and broke it. The siege, which had lasted 105 days, was immediately raised. The garrison lost 3200 men; and, of the 4300 who remained, more than 1000 were unfit for duty. The loss of the besiegers, between the number slain in the siege and retreat, and those who died from disease in their camp, was 8000. On the representations of the heroic Walker, the twelve London Companies advanced 100*l.* each for the repair of the city; wood was supplied by the Society, abatements made in the rents, and the terms of many leases rendered more favourable to the tenants. The town-hall, which had been destroyed during the siege, was rebuilt in 1692. In 1789 a wooden bridge was commenced over the Foyle, where, previously, the only means of passage had been a ferry. The architect was Lemuel Cox, an inhabitant of Boston in New England. The original expense was 16,294*l.* 6*s.* 0*d.* Two years completed the work, which, having been frequently repaired at an expense rather greater than the original cost, is still standing. The length is 1068 feet, and the breadth 40. A turning bridge near the western end of the structure admits the passage of vessels up the river. The greatest depth of the Foyle here at low-water is 31 feet, and the rise of the tide is from five to nine feet. The depth of water at the quays is from 12 to 14 feet at low-water of neap tides. The velocity of the current is from three to four miles an hour in the narrowest part of the channel, and from two to three in the widest.

The charter of the corporation bears date the 11th Jan., 18 Car. II. The governing body is the common-council, consisting of 12 aldermen, including the mayor, 24 chief burgesses, and two sheriffs. The mayor is chosen by the common-council from the aldermen. The freedom is acquired by birth, servitude, marriage, and special favour. The recorder is presented by the corporation and appointed by the crown. The city sessions, to hear and determine felonies, are held three times in the year. A court of record, with civil jurisdiction, unlimited in amount, is held before the mayor or recorder once a week. With the exception of the rent of the market tolls, amounting to 170*l.* per annum, the corporation do not now possess any property not held for special public trusts. In Feb., 1833, they owed a total debt of 66,444*l.* 17*s.* 6*d.*, of which 34,690*l.* 9*s.* 11½*d*, was paid off by a sale of their then remaining property. The balance due has since increased to 32,971*l.* 7*s.* 6½*d.*, to pay which there are not now any funds, save the above rents, available.

Prior to the Union, Londonderry city returned two members to the Irish parliamsnt. Since that time it is represented by one member only. The franchise is now in the 10*l.* householders and freemen. On the 1st April, 1835, the constituency consisted of 724 electors.

The general appearance of the city is nighly imposing. The hill on which it stands rises boldly over the Foyle, the banks of which on both sides are steep and wooded. On the summit of the hill, 119 feet above the level of the river, is the cathedral, the spire of which rises to the height of 178 feet from the churchyard. Walker's testimonial—a fluted Doric column, 90 feet high—springs nearly from the same level on the central western bastion. These objects, with the cupola of the town-house, give a very striking outline to the mass of buildings which stretches from the water's-edge up the northern and eastern acclivity of the hill, and spreads westward into an extensive suburb occupying the lower part of the valley which separates the hill and site of the old town from the adjoining eminences. The bishop's palace stands within the walls at the south-western extremity of the town, near the cathedral. Between the cathedral and palace is the court-house, a very handsome edifice, exhibiting a façade of 126 feet, consisting of an Ionic portico of four columns with wings adorned with Doric pilasters, and surmounted by statues of Peace and Justice. The building was commenced in the year 1813, and cost 30,479*l.* 15*s.* Outside the walls, on this side, is the county gaol, a very spacious and strong building, completed at an expense of 33,718*l.* (Irish) in the year 1824. The crown-prison department is somewhat too extensive for the demands of justice in so peaceable a county. Outside the walls, at the opposite extremity of the town, facing the river, is the custom-house, a hollow square of buildings, 170 feet by 130. The quays extend from the bridge northward for rather more than half a mile, and terminate in a patent slip, constructed in 1830 at a cost of 4000*l.* This slip is found to answer all the purposes of a dry-dock for vessels of 300 tons register. A general ship-yard is attached, in which vessels of 200 tons and upwards have been recently built. The walls and ramparts are still kept in repair, and form an agreeable promenade for the citizens. Between 1803 and 1808 the three principal gates were built at a cost of 1403*l.* 3*s.* Bishop's-gate, which forms the entrance at the side occupied by the cathedral and court-house, is a handsome triumphal arch with lateral passages, erected by the corporation in 1789.

The lighting, cleansing, and watching of the city are managed by a committee under the act of 2 and 3 Wm. IV., c. 107. The gas-works which supply the city were established by a joint-stock company in 1830, at an expense of 7000*l.* The supply of water is from a tank on the opposite side of the river. The water is conveyed across the bridge by pipes which close by the operation of the same machinery that opens the turning platform in the bridge for the occasional passage of vessels. Turf-fuel is procured from the bogs of Clondermot, on the eastern bank of the Foyle. The quantity of coal and culm imported in 1835 was 13,966 tons, of the value of 8728*l.*

The port is under the control of a committee acting under the provisions of the 2nd and 3rd Wm. IV., c. 107, which act also regulates the tonnage duties. The quays, which

831 were the property of the corporation, are now ıands of private individuals and companies. There nty-one such quays and wharfs, including two on erside bank of the river. The shipping belonging port in 1837 consisted of forty sailing vessels of an te tonnage of about 6000 tons, and of six steam-' an aggregate tonnage of 1063 tons.

number of vessels employed in the foreign trade ntered inwards in 1837 was forty-six, of an aggregate of 8385 tons; outwards fifteen, of an aggregate of 4886 tons. Coastwise, in the same year, the inwards was 687, and the tonnage 79,935 tons; s 543, tonnage 66,260 tons. These returns, com-vith those of 1826, exhibit a considerable decrease oreign trade; but a much more than corresponding in the trade coastwise, which, within the last ten as more than doubled.

of Londonderry in the year 1835 (*exclusive of re-shipments of Sugars*).

Articles.		Quantity.			Estimated value.
		Number.	Tons.	cwt.	
					£
l, and flour	cwts.	416,042	20,802	2	120,676
(including . .	cwts.	85,890	4,294	10	273,566
tow .	cwts.	81,120	4,056	0	212,940
. .	cwts.	3	0	3	15
. .	galls.	63,480	283	6	10,580
. .	yards	5,035,992	839	6	314,749
ınufactures	yards	968	0	3	24
cows .	head	855	285	0	5,130
. .	head	73	36	10	1,440
. .	head	313	9	10	265
. .	head	11,103	740	4	13,890
. .	No.	33,056,000	1,180	11	55,094
l calf-skins, d . .	No.	22,960	574	0	11,235
cles .	value	. .	. .		21,080
					£1,040,774

e same year the imports amounted to an estimate f 708,054*l*. The chief articles were sugar, 58,744*l*.; 4,520*l*.; British spirits (chiefly Scotch whiskey), .; tea, 19,255*l*.; flax-seed, 16,896*l*.; haberdashery parel, 13,550*l*.; fish (chiefly herrings), 10,811*l*.; 9570*l*.; glass and earthenware, 8980*l*.; tobacco, and coal and culm, 8728*l*. The customs of the port year 1837 amounted to 99,652*l*.

estimated that the quantity of goods of all kinds annually into the city by inland conveyances is tons, of which 37,000 tons are for exportation; at the total quantity of goods carried out of the city 00 tons, of which 54,400 tons consist of goods im-

The grinding of grain (chiefly oats) is the chief of manufacture carried on in the city and suburbs. are two extensive distilleries, a brewery, copper-works rge scale, and a metal foundry. In these seven engines are employed, of an aggregate of 116 horse-

The salmon fishery of the Foyle gives employment men besides water-keepers. The fish are exported rpool, Glasgow, Bristol, and Dublin, in boxes, packed e. The produce has increased greatly within the years, in consequence of the introduction of stake-In 1835 the total number of fish taken in stake and t nets in the Foyle was 55,906, weighing 143 tons This fishery belongs to the Irish Society.

518-19 the total number of houses in the city was abited by 102 families; in 1814 the number of houses imated at 1458, and of inhabitants at 10,570; in 1821 mber of houses was found to be 1329, and of inhabit-313. In 1831 the numbers were—houses 1405, in-its 10,130, comprising 1972 families: of which number ilies were chiefly employed in agriculture; 1297 in manufactures, and handicraft; and 641 were not d in either class. According to the Report of the issioners of Public Instruction, the numbers in 1834

Within the walls . . .	2,121	
Without the walls . .	11,164	
		13,285

ese appear to be still increasing.

re were, in 1836, in the city, suburbs, and liberties, y schools, supported wholly by the pupils, educating 748 males and 504 females; and 12 daily schools, supported wholly or in part by contributions and bequests, educating 680 males and 564 females. Gwyn's Charitable Institution has an income of 1870*l*. 13*s*. per annum; in 1836 there were 81 boys on the establishment. The Diocesan and Free Grammar-school has an income of 600*l*. per annum, 567*l*. 6*s*. 2*d*. of which is contributed by the London companies, the Irish Society, and the bishop. The Irish Society also contributes to the support of eight other schools. Two schools, in 1836, were in connection with the National Board of Education. In the city is a public library and news-room, with a collection of about 300 volumes, established in 1819, and in 1824 transferred to a new building now partly occupied by the Chamber of Commerce. There is also a literary society, established in 1834. The savings'-bank, established in 1816, had deposits amounting to 16,226*l*. 15*s*. 6*d*. on the 10th Nov., 1835. The number of depositors was 699. Two weekly newspapers are published in the city.

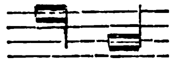
Of the charitable institutions the principal are:—the Mendicity House, established in 1825 by Bishop Knox, and supported by voluntary donations averaging 600*l*. per annum; the Poor-Shop, established in 1821 to provide the indigent with clothing and bedding at prime cost, supported by contributions averaging about 45*l*. annually; and the Ladies' Penny Society, established in 1815, for the relief of sick and indigent room-keepers, supported by subscriptions averaging 200*l*. per annum. There are also a charitable loan-fund, a penitentiary for females, and some minor charities. The district lunatic asylum stands on the north of the city. It was opened in 1829, at a cost of 25,678*l*. 2*s*. 4*d*., and is calculated for 104 patients. The funds for its support are advanced by government, and repaid by the counties of the district. The county infirmary and fever-hospital, opened in 1810, and the dispensary, established in 1819, are supported by annual subscriptions and grand-jury presentments. The annual average of patients relieved in the former is 407, and of those relieved by the latter 1564.

(*Ordnance Memoir of the City and North-western Liberties of Londonderry*, 4to., Dublin, 1837; *Report of Railway Commissioners*, Ireland, 1838; Leland's *History of Ireland*, &c.)

LONG, ROGER, was born in the county of Norfolk about the year 1680. At the age of seventeen he entered Pembroke Hall, Cambridge, took the degree of Master of Arts in 1704, and that of Doctor of Divinity in 1728. The following year he was elected a Fellow of the Royal Society and Vice-Chancellor of the University; in 1749 he was appointed Lowndes' Professor of Astronomy, and in 1751 he was presented to the rectory of Bradwell in Essex, which he held until his death, 16th December, 1770. His principal work is a treatise on astronomy, in two large quarto volumes, the first of which was published in 1742, the other in 1764: a second edition appeared in 1784. This work contains very good descriptions of the apparent motions of the heavens. Besides his astronomy he wrote, under the signature of Dicaiophilus Cantabrigiensis, a pamphlet entitled 'The Rights of Churches and Colleges defended,' 1731, 'Reply to Dr. Gally's pamphlet on Greek accent,' 1755; 'Life of Mahomet,' prefixed to Oakley's 'History of the Saracens,' 1757; 'Music Speech spoken at the public commencement, July 6, 1714,' and other poems, London, 1719, to which is prefixed a short notice of the author's life. With a view to popularise the science of astronomy, he caused to be constructed a hollow sphere, wherein thirty persons could sit conveniently, and on the inner surface of which was a representation of the heavens as they would appear to an observer in north latitude. The keeper of this sphere, who is generally an undergraduate, receives 6*l*. per annum. (*Cambridge Calendar*.) The habits of Dr. Long were peculiarly moderate, his ordinary drink being water; and for some years previous to his death he abstained altogether from eating animal food. By his will he bequeathed 600*l*. for the benefit of his college. (*Biog. Brit.; Memoir* of Dr. Wood mentioned above.)

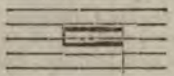
LONG ISLAND. [NEW YORK.]

LONG, a character used in old music, formed of a breve with a stem added, thus—



and equal in time, or duration, to two breves, or four semi breves, &c. It is rarely met with in compositions of later date than the middle of the seventeenth century, and is now hardly known, except to the musical antiquary.

Still more obsolete is the LARGE (a word omitted in its proper place), a character nearly in the above form, but the head is much more extended. Ex.·



This is the longest note ever used in musical notation, and equal to two longs, four breves, &c.

LONGFORD, an inland county of the province of Leinster in Ireland, bounded on the north-west by the county of Leitrim, on the north-east by the county of Cavan, on the south-east by the county of Westmeath, and on the south-west by the county of Roscommon, from which it is separated by a part of Loch Ree and the river Shannon. According to the map of Ireland published under the superintendence of the Society for the Diffusion of Useful Knowledge, it lies between 53° 29′ and 53° 56′ N. lat., and between 7° 19′ and 7° 56′ W. long. According to the map of the Ordnance Survey of Ireland, it extends from the Leitrim boundary at Gulladoo Loch on the north to the Westmeath boundary on the south, 29 statute miles, and from the Shannon at Tarmonbarry bridge on the west to the Inny near Loch Kinale on the east, 22 miles. Its area, according to the same map, consists of—

	Acres	r.	p.
Land . .	255,734	1	10
Water .	13,675	0	23
Total . .	269,409	1	33

or 421 square statute miles nearly. In 1831 the total population was 112,558.

The general slope of the surface is westward and south-westward towards the Shannon, except in the north-eastern angle towards Cavan, where the county embraces a small portion of the basin of Loch Erne. This district, forming the immediate basin of Loch Gownagh, is separated from the remainder of the county by a slightly elevated tract upon the south, and by a series of hills of low elevation on the west. The latter eminences range from 200 to 400 feet above the level of the lake, and form the eastern front of the Cairn Clonhugh group. Loch Gownagh is a very irregular piece of water extending from north to south five miles and a half, and from east to west nearly five miles, but from its being rather a collection of lakes communicating by narrow channels than one sheet of water, it does not in all cover more than about 3000 acres, of which 2278 acres are within this county. Its chief feeders are small streams running from the surrounding hilly country. There are several pretty wooded islands in the lake, and the shores are picturesque and in some places finely planted. The Cairn Clonhugh hills, extending about ten miles from north-east to south-west, occupy the greater part of the district between Loch Gownagh and the Shannon. The chief heights are Crott on the north-east (686 feet) and Cairn Clonghugh near the opposite extremity of the group (912 feet). The general character of these hills is tame and pastoral. They form the southern boundary of the district of Drumlish, a bare tract extending along the southern border of Leitrim, and watered by the Ballinamuck, or Clonard river, which rises from Loch Annagh, in the north of the Cairn Clonhugh hills. Ballinamuck is a small place, and much of the surrounding country is moory and barren: the surface improves towards Drumlish, which is a place of some trade in grain. The angle included between the Shannon and the river Rinn, which flows southward out of Leitrim [LEITRIM], is much encumbered with bog. Between the western termination of the Cairn Clonhugh hills and the Shannon is an open well-cultivated tract, in which the thriving town of Newtown Forbes is situated. Newtown Forbes lies about two miles eastward from the Shannon, which here spreads into a lake three miles long by from a mile and a half to half a mile in width, called Loch Forbes. The intermediate flat, being about two miles every way, is occupied by the extensive plantations of Castle Forbes, the seat of the Earl of Granard. The south-eastern slope of the Cairn Clonhugh hills forms one side of the immediate valley of the Camlin, a considerable river, which, taking its rise in the extreme east of the county, skirts the low range bounding the basin of Loch Gownagh on the south, whence flowing through the small lakes of Killeen and Ballinlough, it runs in a westerly direction, by a winding course of upwards of twenty miles, to the Shannon, which it enters two miles south of Loch Forbes, at Tarmonbarry. The country through which the Camlin flows is open and well improved. The southern bank of the river in particular is beautified by numerous seats and well planted demesnes. On the more elevated portions of the plain, between the sources of the river and Loch Gownagh, is the town of Granard. A little lower down the river is St. Johnstown. Nearer the Shannon is Longford, the assize town of the county, principally situated on the southern bank of the Camlin. Between Longford and the Shannon, the Camlin receives two considerable streams from the south, of which the Keenagh river is the larger. The district intercepted between the Keenagh and the Shannon, which along the south-western boundary of this county expands into the extensive lake of Loch Ree, is very flat and boggy. The arable portion of this district towards the Shannon is low, and along the shores of Loch Ree, which here forms the boundary of the county, is liable to extensive winter-floods. These inundations materially alter the appearance of the coast-line of the lake, submerging several large peninsulas and converting others into islands.

Next to the district of Ballinamuck, this is the least productive part of the county. Along the shore of Loch Ree there are however some handsome demesnes and good tracts of pasture-land. The towns are Cloondara, or Richmond Harbour, at the terminus of the Royal Canal, which traverses this part of the county in a direction nearly parallel to the Keenagh river; and Lanesborough, at the head of Loch Ree, where the Shannon is crossed by the road leading to Roscommon. An inlet of Loch Ree, running about four miles eastward from the main sheet of the lake, bounds this part of the county on the south. Near the shore, in this direction, are the small lakes of Derry and Derrymacar, the latter of which in winter becomes a portion of the enlarged sheet of Loch Ree. The level of Loch Ree in summer is 122 feet and in winter 129 feet above the sea at low water. At the head of the above-mentioned inlet is the confluence of the Inny, which, next to the Suck, brings down a larger body of water than any other tributary of the Shannon. Its sources are in the county of Cavan, where the streams which feed Loch Sheelin have their rise: issuing from Loch Sheelin, it passes through Loch Kinale at an elevation of 212 feet above the sea, in the eastern extremity of Longford; thence, forming for a few miles the boundary between Longford and Westmeath, it enters the latter county, where it expands into the beautiful lake of Derravaragh; passing from which, through Loch Iron, it again becomes the county boundary for a few miles; then, running under the line of the Royal Canal at Quin's Bridge Aqueduct, near Abbeyshrule, it cuts off a small portion of the extreme south of Longford, and flowing westward, by Ballymahon, enters the Shannon at the head of the eastern inlet of Loch Ree. The valleys of the Camlin and Inny are separated by a low table-land, which rises into only one conspicuous eminence of 650 feet at Slieve Goldry. The remainder of this plain, especially towards the Inny, is much diversified by low ranges of eskers, similar in structure and direction to those of the south of the county of Leitrim. On the side of this plain, towards the Inny, are the towns of Ballymahon and Edgeworthstown. The neighbourhood of Ballymahon is the most highly improved part of the county, being in all respects similar to the rich plain of Westmeath, of which it is a continuation. The only striking natural feature in this part of the line is Glen Loch, a sheet of water about a mile and a half in length, south of Edgeworthstown. The stream issuing from it runs southward to Loch Iron and the Inny. There are numerous other small lakes throughout the county.

The Shannon, between the points where it becomes the boundary of the county, has a coast-line, including windings, of about fifty miles. Above Loch Ree there is no navigation by passenger-boats. The trade-boats plying on the line are barges of from thirty to fifty tons, drawing from 3½ to 4½ feet water. The freight, including tolls, is one penny per mile. The total amount of goods carried in both directions, in the year 1835, was 9770 tons, of which 6700 tons consisted of grain. The Inny offers peculiar facilities for navigation; but as yet there has been no attempt made to remove the slight obstructions which prevent the ascent of boats. The Royal Canal, entering the county at first nearly parallel to the Inny, turns northward at Ballymahon, from which its course is parallel to that of the Keenagh river. At Abbeyshrule, near where it enters the county, its elevation is 223 feet above the level of the sea, and at Cloondara, at its terminus, 139 feet. The intermediate descent of 84 feet is distributed over seven locks. A branch of six miles in length, on one level, is carried from the main line near Killashee, across the Keenagh and Ardagh rivers, to Longford town, where it terminates in a small basin. Fly-boats for passengers have recently been established along the entire line to Dublin, which perform the trip from Longford to Dublin in fifteen hours. The time required by the slow passenger-boats is twenty-two hours. The principal goods conveyed on the Royal Canal are grain, potatoes, pigs and black cattle, turf, bricks, and small quantities of iron from the Arigna works, downwards; the return trade is chiefly in coals, merchandise, and manure. The trade-boats carry from forty to sixty tons, and draw 4½ feet water. The total number of passengers conveyed by fly-boats on the canal, for the year ending 1st of May, 1837, was 18,130, and by slow passenger-boats 28,320. At the time of this return the fly-boat system had not been extended beyond Mullingar. In the year 1837 the number of live pigs conveyed to Dublin by this canal was 34,349; of casks of butter, 3638; of tons of corn-meal and potatoes, 26,024; of tons of merchandise, 6247; of tons of coal and manure, 14,559; of tons of turf, 21,724; and of tons of stones, sand, flags, and bricks, 16,127: making a total tonnage of 84,683 tons, producing a total amount of toll of 10,964*l.* 16*s.* 5*d.* The country is in general well opened with highways, which are kept in good repair by the county.

The climate is not so genial as that of the midland counties in general. There is a considerable extent of wet and marshy surface.

Geology.—The entire district south of the Camlin consists of the floetz limestone of the central plain, with the exception only of two patches of sandstone, one extending across the bed of the river Inny round Ballymahon, and the other constituting the mass of Slieve Goldry, and spreading northward to near the town of Longford. The immediate valley of the Camlin on its southern bank, and the entire tract extending northward from it to the county of Leitrim, consist of clay-slate, constituting a portion of the grauwacke formation of Cavan. Between the western extremity of the clay-slate field and the limestone, which crosses the bed of the Camlin near its junction with the Shannon, and occupies the level country round Newtown Forbes, a belt of yellow sandstone and conglomerate intervenes: this last formation is in connection with a tract of a similar character in the south of the county of Leitrim. The eskers, or low gravel region, which occur so frequently throughout the southern and south-eastern parts of Longford, are also similar in character to those of the last-mentioned county. They contain large quantities of fine calcareous sand and marl. Marly clay also underlies many of the boggy tracts, in some places to a thickness of ten feet between the bog and the limestone rock; but in general the thickness of this bed of clay is one foot only. The average depth of the bogs is thirty feet: they contain the same vegetable matter and subsoil, and are reclaimable by the same means as those of the other midland counties.

A small tract, similar in character to the millstone-grit formation [LEITRIM], occurs near Loch Gownagh. The iron-stone is said to be equal to the best Swedish ore, and to be associated with coal-shale; but the traces of coal in this district ought probably to be referred to the detritus of the coal-tract of Loch Allen. Lead ore has been found in the quarries in the limestone district, and exposed in the beds of streams, but no workings have hitherto been attempted. Marble is raised in the vicinity of Ballymahon: it is of a deep grey colour, and polishes well.

Soil, &c.—From the great quantity of bog and surface-water in the western part of the county, the soil in this district is not equal to that of the tract sloping towards the valley of the Inny. Here the characteristics of the limestone plain are found in a rich vegetable mould, producing either heavy grain crops or sweet fattening pasture. The rest of the county is chiefly grazing land. Great quantities of butter are made by the farmers and cottiers. Pigs are reared in great numbers. The feeding of sheep is not much attended to. The returns of the sale of grain in the several market-towns are defective. About 15,600 barrels of oats are annually sold in the market of Granard, and about 2600 barrels at Edgeworthstown. At Ballymahon and Longford are also brisk markets for the sale of wheat, oats, and barley.

The condition of the working population is very low. Sixpence per day, for eighty working days in the year, is the amount of wages stated for agricultural labourers in this county, in the Appendix to the Report of the Commissioners to inquire into the Condition of the Poor in Ireland. The people live almost entirely on vegetable food: they are nevertheless strong and healthy; but want of regular occupation and inefficient return for their occasional employment has added to a spirit of recklessness, the effects of which are apparent in the criminal returns.

The linen manufacture is carried on with some activity in the neighbourhood of Newtown Forbes, where the first Earl Granard took pains to introduce it. The manufacture of coarse flannels and friezes for home consumption is also attended to throughout the county. In 1831 there were in Longford 4 brewers, 104 coopers, 12 hacklers of flax, 15 tanners, and 553 weavers of linen and woollen fabrics.

The only seats of the nobility are Castle Forbes, the residence of the Earl of Granard, and Longford Castle, of the Earl of Longford. Carrickglass, the seat of the Lefroy family, near Longford, on the Camlin river, has an extensive demesne; so also have Cloonfin, Lissard, Fox Hall, Doory Hall, Castlecore, and Newcastle, which three last are in the vicinity of Ballymahon.

Divisions, &c.—Longford is divided into the baronies of *Longford*, on the north-west, containing the towns of Longford (pop. in 1831, 4516), Drumlish (pop. 574), and Newtown Forbes (pop. 537), and the villages of Cloondra (pop. 214) and Ballinamuck (pop. 163); *Granard*, on the north-east, containing the town of Granard (pop. 2069), and the villages of Abbeylara (pop. 316), St. Johnstown (pop. 255), and Bunlahy (pop. 299); *Ardagh*, on the east, containing the town of Edgeworthstown (pop. 1001) and the village of Ardagh (pop. 142); *Abbeyshrule*, on the south, containing only hamlets; *Rathcline*, on the south-west, containing the town of Ballymahon (pop. 1081), and the villages of Lanesborough (pop. 390) and Keenagh (pop. 396); and *Moydow*, on the west and centre, containing the village of Killeshea (pop. 351.)

Prior to the Union, Longford sent ten members to the Irish parliament; two for the county, and two for Longford, Lanesborough, Granard, and St. Johnstown, respectively. The representation is now limited to two members for the county. In 1837 the constituency consisted of 1388 voters. The assizes are held at Longford, and general quarter-sessions at Longford and Ballymahon.

The constabulary force on the 1st of January, 1836, consisted of 4 chief-constables, 23 constables, 117 sub-constables, and 5 horse; the cost of supporting which establishment was 5482*l.* 16*s.* 2*d.*, of which 2678*l.* 13*s.* 10*d.* was chargeable against the county. The number of persons charged with criminal offences, who were committed to the county gaol in the year 1836, was 607, of whom 557 were males and 50 females, being in the proportion of one criminal offender in 185 of the entire population. The district lunatic asylum is at Maryborough, in Queen's County. The proportion paid by Longford towards the expense of its erection is 4987*l.* 8*s.* 3*d.* The county infirmary is at Longford, and there are dispensaries at Granard, Ballymahon, Edgeworthstown, and Keenagh. There are barracks at Granard and Longford, together affording accommodation for 400 men and 200 horses.

Longford town is incorporated by charter of 26th Nov., 20th Car. II. The governing body consists of the sovereign, bailiffs, and burgesses; there is a seneschal's court with jurisdiction to 200*l.*, but no corporate criminal jurisdiction nor borough gaol. The paving and cleaning of the town are under the control of commissioners acting under the 9th Geo. IV., c. 82. The town is not lighted. Longford is principally built on the southern bank of the Camlin: the county court-house and gaol, and the barracks, are on the opposite side of the river. The town is handsome, and has an appearance of cheerfulness and business. There have been extensive stores erected at the basin which terminates the Grand Canal on the southern side, in which direction several new streets are laid out. The Earl of Longford has recently built a butter-market and shambles. There are branches of the Bank of Ireland, the National Bank, and the Agricultural and Commercial Bank, established here.

Lanesborough has also a charter of the 17th Car. I., but the governing body has not exercised any corporate functions since the Union. Its situation, with a bridge over the Shannon, is favourable to trade, and it has a brisk market for agricultural produce. Great quantities of eggs pass through Lanesborough by the Royal Canal to Dublin and the English markets.

St. Johnstown is incorporated by charter bearing date 3rd April, 3rd Carl. I.; but there are now no traces either of the corporate jurisdiction or of the lands bestowed for its establishment.

Granard, erected into a borough by charter of Charles II. in 1678, is a well-built town, consisting chiefly of one wide street, about half a mile in length. The remains of old Granard, a place of great antiquity, are still traceable a little distance to the west of the present town. A lofty earthen fort, the summit of which is 593 feet above the level of the sea, and about 150 above the surrounding plain, stands at the eastern extremity of the present town, and commands a fine prospect over the extended plains of Meath, Westmeath, and Longford.

Ballymahon and Edgeworthstown are rather large villages than towns. Both are centrally situated, and have brisk markets for grain.

The village of Ardagh, containing 142 inhabitants, gives name to a bishop's see in the province of Armagh. The see, which was founded in the sixth century, was united to the bishopric of Kilmore in 1658; and that union being dissolved, was afterwards, in 1742, annexed to the archiepiscopal see of Tuam, the archbishop holding it as a suffragan of the primate. By the provisions of the Church Temporalities Act, the see, on the demise of the present archbishop of Tuam, is to be reunited to Kilmore.

Population.

Date.	How ascertained.	Houses.	Families.	Families chiefly employed in agriculture.	Families chiefly employed in trade, manufactures, and handicraft.	Families not included in the preceding classes.	Males.	Females.	Total.
1792	Estimated by Dr. Beaufort .	10,026	..	..	..	..	..	..	50,100
1813	Under Act of 1812 . .	16,346	..	..	..	..	..	..	95,917
1821	Under Act 55 Geo. III., c. 120	18,987	21,650	..	..	..	53,215	54,355	107,570
1831	Under Act 1 Will. IV., c. 19 .	19,418	20,438	15,461	2,553	2,424	55,310	57,248	112,558

History and Antiquities.—The territory at present constituting the county of Longford was originally a portion of the kingdom of Meath, and as such was included in the grant of Meath by king Henry II. to Hugh de Lacy, from whom it came through his son Walter to a female heiress, one of Walter's two daughters. Owing to the negligence of her descendants, who lived in England, the territory was lost to the absentee owners. On the erection of the district into a separate county, in the 11th of Elizabeth, it retained few or no traces of ever having been under the authority of the English law or government. The O'Farrels, who almost exclusively inhabited it at this time, consented, on the 11th Feb., 1570, to surrender their interest, and take back their lands on English tenures. On the 12th of April, 1615, a commission was appointed by king James to inquire into his title to the territory. An inquisition was accordingly taken, by which it was found that, under a proviso in the grant of Elizabeth, the crown was entitled by virtue of the act of absentees. On the 5th of August in the same year a commission was issued empowering the Lord Deputy and others to dispose of the estates, so found to be in the king, to patentees. In the distribution which followed the natives had a preference. Upwards of 13,000 acres were assigned to members of the O'Farrel family, and of the entire residue of the county only 17,904 acres were allotted to the new-comers, the remainder being parcelled out among the old inhabitants. The rent reserved to the crown on the new grants was 3*d.* per acre. The plantation did not take effect to any great extent, as in 1641 the entire county appears to have been seized back by the O'Farrels, excepting only Longford Castle and Castle Forbes. The confiscations which ensued extended over nearly the entire county, and introduced almost a totally new proprietory.

The remains of the old town of Granard possess considerable interest when taken in connection with the neighbouring rampart of Duncla, which runs from Loch Kinale to Loch Gownagh, a distance of nearly eight miles. This work is in all respects similar to the Dane's Cast [DOWN], and probably formed part of the division between the antient kingdoms of Meath and Ulster. On the island of Inch-Clorin, in Loch Ree, are the ruins of seven churches, and the foundation of a round-tower. An abbey was founded here, about A.D. 540, by St. Dermid. There are the foundations of another round-tower at Granard. The Lord Richard Tuite, A.D. 1205, built an abbey at Granard in honour of the Virgin, which was afterwards rifled by the Scots, under Edward Bruce, in 1315. In 1541 Richard O'Ferrall, the last abbot, was made bishop of Ardagh. The abbey at Longford was one of Patrick's foundations. O'Ferrall, or O'Farrel, prince of Annaly, founded a very fine monastery on the site of this abbey, A.D. 1400. The church of the friars is now the parish church. Abbeyshrule was another rich foundation of the same family. In Loch Ree, besides the seven churches of Inch-Clorin, were the monasteries of All Saints, founded by St. Kieran in the year 544, and Innisbofin, founded by a nephew of Patrick about the year 530, on islands bearing these names respectively. There are remains of all the preceding, as also of the religious houses of Moydow, Clonebrone, Clone, Derg, and Innismore, a foundation of St. Columba's, on an island in Loch Gownagh. A few castles are still partially standing; the principal ones are at Castle-Forbes, Granard, Tenallick, Castlecor, Rathcline, and Ballymahon.

The county expenses are defrayed by grand-jury presentments. The amount levied in 1835 was 12,606*l.* 9*s.* 2*d.*, of which 4162*l.* 18*s.* 5*d.* was for roads and bridges; 2209*l.* 6*s.* 2½*d.* for public buildings, charities, salaries, &c.; 2678*l.* 13*s.* 10*s.* for police; and 3556*l.* 10*s.* 8½*d.* for the repayment of loans advanced by government.

(*Transactions of the Geological Society*, vol. v.; *Report of the Railway Commissioners for Ireland; MSS. in the Library of the Royal Dublin Society;* Cox's *History of Ireland; Parliamentary Reports and Papers.*)

LONGI'NUS, the author of a treatise in Greek 'On the Sublime,' is said to have been born either in Syria or at Athens, but at what time is uncertain. His education was carefully superintended by his uncle Fronto, a celebrated teacher of rhetoric; and he also received instruction from the most eminent teachers of philosophy and rhetoric of his age, especially from Ammonius and Origen. He afterwards settled at Athens, where he taught philosophy, rhetoric, and criticism to a numerous school, and numbered among his disciples the celebrated Porphyry. His school soon became the most distinguished in the Roman empire. After remaining at Athens for a considerable time, he removed to Palmyra at the invitation of Zenobia, in order to superintend the education of her sons. He did not however confine his attention to this duty, but also took an active part in public affairs, and is said to have been one of Zenobia's principal advisers in the war against Aurelian, which proved so unfortunate to himself and his royal mistress. After the capture of Palmyra by Aurelian, A.D. 273, Longinus was put to death by order of the emperor.

Longinus wrote many works on philosophical and critical subjects, now known only by their titles, none of which have come down to us, with the exception of his treatise 'On the Sublime,' and a few fragments, preserved by other writers. There is however some doubt whether the treatise 'On the Sublime' (περὶ ὕψους) was in reality written by this Longinus. Modern editors have given the name of the author of this treatise as 'Dionysius Longinus;' but in the best MSS. it is said to be written by Dionysius, *or* Longinus, and in the Florence MS. by an anonymous author. Suidas says that the name of the counsellor of Zenobia was Longinus Cassius. Some critics have conjectured that this treatise was written by Dionysius of Halicarnassus, or by Dionysius of Pergamum, who is mentioned by Strabo (625, Casaub.) as a distinguished teacher of rhetoric; but the difference of style between this work and the acknowledged works of Dionysius of Halicarnassus renders this conjecture very improbable, and as to the other Dionysius, the conjecture has no foundation. The treatise 'On the Sublime' has for its object the exposition of the nature of the sublime, both as to the expression and the thought, which the author illustrates by examples. As a specimen of critical judgment the work has always maintained a high rank, and in point of style is perspicuous and precise.

The best editions of Longinus are by Pearce (1724), Morus (1769), Toup (1778), and Weiske (1809); the best translations are the German by Schlosser, the French by Boileau, and the English by W. Smith.

LONGIPENNES, Cuvier's family name for the long-winged oceanic birds (Grands Voiliers), such as the *Petrels*, *Albatrosses*, &c. The genera which he includes in this family are *Procellaria*, *Puffinus*, *Halodroma*, *Pachyptila*, and *Diomedea*.

LONGIROSTRES, Cuvier's name for a family of wading birds (oiseaux de rivage), in which he includes the genera *Ibis*, *Numenius*, *Scolopax*, *Rhynchæa*, *Limosa*, *Calidris* and *Tringa*, *Arenaria* (*Calidris*, Vig.), *Pelidna*, *Falcinella* (*Erolia*, Vieill.—*Scolopax pygmæa*, Linn.), *Machetes*, *Hemipalama*, *Eurinorhynchus*, *Phalaropus*, *Strepsilus*, *Totanus*, *Lobipes*, and *Himantopus*,—the greater part of which, as he observes, would come under the great Linnean genus *Scolopax*. He remarks that one can hardly place the *Avosets*, *Recurvirostra*, Linn., in any other position than at the end of the *Longirostres*.

LONGITUDE and LATITUDE. These terms mean different things as applied to a point of the earth, or a star in the heavens; and we must accordingly distinguish between *geographical* latitude and longitude, and *celestial* latitude and longitude.

The latitude of a star in the heavens is its angular distance from the ecliptic, measured on a great circle drawn through the star and pole of the ecliptic. It differs from the DECLINATION only in this, that the ecliptic is used instead of the equator. The longitude of a star is the angle made by the circle on which latitude is measured with the circle which passes through the pole of the ecliptic and the vernal intersection of the equator and ecliptic. Thus a star on the ecliptic has no latitude, and one which lies directly between a pole of the ecliptic and the vernal equinox has no longitude. The use of celestial longitudes and latitudes has in great measure been superseded by those of right ascensions and declinations.

The meaning of the term geographical longitude is the same whether we consider the earth as a sphere or a spheroid. It is the angle contained between the plane of the meridian of the place, and that of some one meridian which is fixed on as the starting-place. Thus we choose the Observatory of Greenwich, and the French that of Paris, as being in the first meridian; and while we express the relative position of the two observatories (in longitude) by saying that Paris is 2° 20′ 24″ east of Greenwich, the French describe Greenwich as 2° 20′ 24″ west of Paris.

It is usual to measure terrestrial longitudes in time [ANGLE; TIME]; the whole circuit of the globe being supposed described (as in the diurnal motion) in 24 hours. It is also usual to reckon longitudes to 180° east or west, without proceeding farther. Thus a motion in longitude of 185° east will bring the traveller into 175° of west longitude. In astronomical writings, however, longitudes (both geographical and celestial) are measured all round the globe.

Supposing the earth to be a sphere, the latitude of a place is the angle subtended at the centre by the arc of the MERIDIAN intercepted between the place and the equator. This angle is equal to the altitude of the pole of the heavens at the place: and the determination of the altitude of the pole is the method usually resorted to for determining the latitude. But the earth not being precisely a sphere, but a spheroid [GEODESY], the zenith line (which is a perpendicular to the tangent plane) does not pass exactly through the centre, and the altitude of the pole is not precisely the angle subtended at the centre by the arc of the meridian. Still however the altitude of the pole is called the latitude of the place; and it must be distinctly understood that a latitude, astronomically determined, is the angle made by a line which is vertical at the place with its projection on the equator. The angle subtended at the centre of the earth by the arc of the meridian is less than the altitude of the pole by a number of seconds equal to

$$\frac{\varepsilon}{\sin 1''} \times \text{sin. twice the latitude,}$$

where ε is the ELLIPTICITY. Assuming this at $\frac{1}{300}$, the above is such a proportion of 11′½ as the sine of twice the latitude is of unity.

The reason why the preceding is not of more importance in the construction of maps lies in this, that when a large portion of the earth is mapped, the scale is necessarily too small to make such an error of any consequence; and when a small portion of the earth is taken, the error is nearly the same in every part of the map, and relative positions are not sensibly affected.

The method of finding longitudes and latitudes is given in the next article. The history of this problem, or rather of that of finding the longitude in particular, divides itself into two portions. The first, or the account of the real progress of the problem, is so mixed up with the history of astronomy and horology, that it would be useless to attempt it within any limits which we could afford: the second is that of the speculators who have misunderstood the problem, and is not worth the recital. Since however there are still persons who imagine that some mysterious *method* is yet attainable, by which the longitude is to be found, and since the conductors of the newspaper press are not all sufficiently aware of the state of the problem to prevent the insertion from time to time of paragraphs which create a most erroneous impression, we shall briefly point out the source of the fallacy which has misled so many persons.

The determination of the longitude requires simply accurate instruments for the measurement of the positions of the heavenly bodies, and one or other of the two following—either perfectly correct watches, or perfectly accurate tables of the lunar motions. The legislature of Queen Anne, which passed an act offering a reward for the discovery of the longitude, the problem being then very inaccurately solved, for want of one or the other, good watches or lunar tables, never contemplated the invention of a *method*, but only of the means of making existing methods sufficiently accurate. And the legislature of George III., which repealed the former act and substituted another, specifically limited the reward to those who should either proceed by improvement of chronometers, or of lunar table. The rewards which were given were to Harrison for the former, and to Mayer's executors for the latter. The latter act is now repealed, and there does not exist any parliamentary offer of a sum of money for further improvements.

Many persons, imagining that, as in the case of the quadrature of the circle, &c., a theoretical difficulty existed, have employed themselves in endeavouring to invent a method, imagining that they should obtain the prize held out by the legislature. Some persons still occupy themselves in this manner; and it is impossible to persuade them either of the repeal of the acts of parliament, or of their having mistaken the nature of the difficulty, which is now, for all practical purposes, entirely conquered. It is impossible to find the latitude of a place without knowing the position of the equator in the heavens, or the longitude without knowing the meridian of Greenwich. The equator has a real existence in the heavens, since its pole is the immoveable point of the heavens, which can be detected (though it is not absolutely occupied by a star) from observation of the motion of the stars, which always preserve their distance from the pole. But the meridian of Greenwich, a purely arbitrary circle of the earth, determined merely by the will of Charles II. that an observatory should be built on a certain hill near London, has no representative in the heavens. The only method then of finding longitude from the heavenly bodies is by finding the hour of the day which it is at Greenwich, at a particular hour on the spot whose longitude is required. It is then known how much of 360 degrees is revolved through by the earth in the period which brings a star from the meridian of the place upon the meridian of Greenwich, or *vice versâ*: and this angle is the longitude. A watch which goes correctly, and is set at Greenwich will carry the time at that place all over the world; or a celestial phenomenon, of which the Greenwich time may be predicted, will, if the moment of its happening be observed at any other place, give the difference of times at the moment of observation. Any proposal for finding the longitude *astronomically*, which does not depend on one or the other of these principles, is useless, unless it be that of actually measuring the distance between the given place and Greenwich, the latitudes of both being known. Whether it be *possible* to use any other than astronomical means for the purpose, it would be presumptuous to decide; but there certainly is no other method which offers the most distant prospect of success.

LONGITUDE AND LATITUDE, METHODS OF FINDING. We shall classify the various modes of determining geographical latitude and longitude partly by the instrumental means of the observer and partly by the nature of the phenomena. The problems are of course the same whatever instrument is employed, for the latitude of a place is the altitude of the pole of the heavens at that place, and the longitude is the difference between the time on the first meridian (we shall always suppose Greenwich to be the first meridian) and the time at the place, at the same physical instant.

Determination of the Latitude at Fixed Observatories and Independently.—1. In determining the latitude at fixed observatories which are furnished with accurate circles, mural, transit, or altitude and azimuth circles [Circle], the altitudes or zenith distances of circumpolar stars are observed above and below the pole. When these are properly reduced, the place of the pole (which lies between the places of upper and lower culmination of each star) is known, and hence the latitude is found. The first object of all astronomers is to fix the latitude of their place of observation, and the details of this operation will be found in the beginning of most of the published series of observations. The account of the latitude of Greenwich in the Greenwich Observations for 1836, p. lviii., of Cambridge in the Observations of 1833-4-5, and of Edinburgh, 1834-5, may be consulted by those who wish to know what the process is, with the most perfect means which we at present possess.

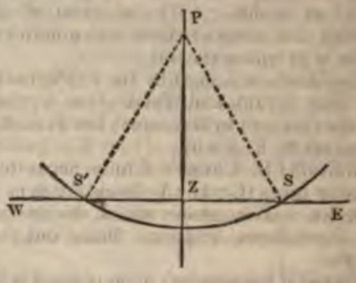
2. Again, if the altitudes or zenith distances of the sun be observed several days before and after the summer and winter solstices, the altitude or zenith distance of the middle point, *i.e.* of the equator, may be deduced. Since the tables of refraction have been perfected by Bessel, these observations give a satisfactory latitude. Both methods may be considered to be independent, as they do not draw their data from other observatories, and no great accuracy is required in the solar tables to reduce the observations of the sun to the solstice. (Pond's *Lat.*, *Greenwich Observations*, part v.)

In the observatories of Europe, and generally where the visible pole of the heavens is tolerably high, the latitude is best determined by circumpolar stars; near the equator an independent latitude must be deduced from circumsolstitial observations.

3. Before the introduction of circles, the latitude in fixed observatories was derived from combining two instruments, the mural QUADRANT and the ZENITH SECTOR. The zenith distances of stars near the zenith, and to the north or south of it, were observed by the zenith sector, and also the distances of the same stars from the pole or the equator by the quadrants; hence the arc between the pole and zenith (the co-latitude), or between the zenith and equator (the latitude), was deduced. The place of the pole was found on the north quadrant from circumpolar stars, and the place of the equator on the south quadrant, from observations of the sun near the solstices, as we have described above. When the present zenith tube was erected at Greenwich, one of its intended uses was to perform the same office for the mural circle as the original zenith sector did for the quadrants.

Determination of the Latitude Differentially.—1. The ZENITH SECTOR, when of the proper size and construction, is perhaps the most accurate instrument for determining latitudes *differentially*, i.e., assuming data which are either known or can be obtained from fixed observatories. With this instrument, the meridian zenith distances of several stars which pass near the zenith may be observed with great certainty; and as the polar distances of those stars are or may be determined at first-rate observatories, the polar distance of the zenith, or the co-latitude, is known. The latitudes for the trigonometrical survey of Great Britain are thus deduced by comparison with Greenwich, the instrument employed being a very fine 8-feet zenith sector by Ramsden. With a better knowledge of the proper motion of the stars, the sector might be used at two places, and the arc between those places obtained from observations of the same stars at two epochs, without reference to any other observations; but at present it is safer, when practicable, to refer directly to corresponding observations made at a fixed observatory.

2. Another differential method has lately been much used (at least by continental astronomers), in which the transit instrument alone is employed. [Transit.] The axis of the instrument is placed north and south, and carefully levelled, in which case its line of sight will describe the prime vertical.



In the figure, let P be the place of the pole, Z the zenith, EZW the prime vertical, which is also the line described by the middle wire of the telescope when it revolves. Let a star, of which the polar distance is well known, be observed at S and S′, and the times noted. Then PS, the polar distance of the star, is known, and the angle SPS′ is equal to the time between the observations, and consequently ½ SPS′, or SPZ, is known; hence we have SP and SPZ in the right angled spherical triangle SPZ, and $\tan PZ = \tan PS \times \cos \angle SPZ$, from which PZ, or the co-latitude, is obtained. This is perhaps the most accurate mode of determining the latitude with moderate instrumental means. The transit should be reversed on alternate nights, so as to get rid of the effect of imperfect collimation or unequal pivots, and the level applied repeatedly before and after the observations. The method depends mainly upon the delicacy of the level and the perfect truth of form in the pivots, and when all precautions are taken the results are surprisingly good. The supports of the instrument must also be perfectly steady during the levelling and the observation. Differences of latitude may be determined by the transit instrument independently, by observing the same stars at the two stations. In this case any error in the assumed polar distance of the stars will not affect the accuracy of the result.

3. If an observer can carry with him a circle, either an altitude and azimuth, or a repeating circle, he may determine the latitude by circumpolar stars independently: but it is better to observe the zenith distances of well known stars several minutes before and after they pass the meridian.* [Circle; Repeating Circle.] The reduction to the meridian is easily computed [Repeating Circle], and the places of the stars inserted in the 'Nautical Almanac' are sufficiently accurate. It is advisable to observe stars at different zenith distances from 70° on each side, to near the zenith, because if there be any fault in the instrument which depends on the zenith distance, the stars will be affected similarly on both sides of the zenith; *i.e.* the zenith distances to the north and south will both be too large or too small. Now as the co-latitude is equal to the zenith distance ± the polar distance when the star is north of the zenith (+ when observed above the pole and − when observed below) and is equal to the polar distance − zenith distance when the star is south of the zenith, it is clear that an error in the zenith distance will have precisely opposite effects on the co-latitude deduced from a north and from a south star. Besides, the coincidence or discrepancy of the observations will afford a tolerable notion of the instrument and the observer, and of the value of the final result. The repeating circle was at one time over estimated, and perhaps at present is not quite rated at its true worth, a careful and intelligent observer will come very near the truth with it, or with the altitude and azimuth circle. Both are rather troublesome to use, and both require either a very solid support, or a second observer to read the level while the first observer bisects the star and

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* The number of minutes which it will be prudent to observe depends on several circumstances. If the time is known to one second, which it ought to be, the observations may be commenced when an error of 1^s in the time will affect the latitude 1″. In ordinary cases, and for observers who do not understand the reason of the thing, 10^m on each side of the meridian is a sufficient direction.

notes the time. Neither can they be considered as portable in ordinary circumstances, when large enough for convenient use. The altitude circle should scarcely be less than twelve inches in diameter in either construction. On the whole we are inclined to prefer the repeating circle as a travelling instrument, and the altitude and azimuth for a permanent situation; but it must be confessed that few observers have the patience or skill to get the greatest possible accuracy out of either. The observations should be confined to stars, as neither of these instruments will keep its adjustments well under the sun.

The repeating circle was used by the French astronomers to determine the latitudes in their great survey. Since that time the instrument has been much better made, and the catalogues of stars which have issued from Königsberg, Greenwich, and Cambridge have supplied more accurate and convenient means of using it. If the levels are very good and sensible, we think that the observations of one fine night, everything being favourable, should bring out the latitude within 2″ or 3″.

4. The last class of instruments to be noticed is that of reflecting instruments, including the reflecting circle of Troughton, the repeating reflecting circle of Borda, and the sextant of Hadley. These will be described under the article Sextant, as the title best suited to their essential quality of reflexion. At present we must suppose a general knowledge of their nature. And first we will suppose the observer to have a stand and a mercurial or other horizon. In this case, standard stars should be observed several minutes before and after the meridian passage to the north and south, between the altitudes of 15° and 60°, and as much as possible in pairs, that is, for each star to the north, a star to the south should be observed about the same altitude, or two, one higher and the other lower, so that the mean altitude should nearly correspond. Whatever errors may exist in the division, glasses, &c., will be the same in each star of the pair, and as the error will affect the latitude differently, the mean latitude will be free from the error very nearly. In this way several pairs may be observed, taking the stars of the 'Nautical Almanac,' and the mean of the whole will come out very near the truth. With a good sextant or circle, and a mercurial horizon, we believe that a careful observer would get the latitude within 5″, in one fine night. It is however supposed that everything is favourable, and especially that the instrument is supported on a stand. This is absolutely necessary for the accurate observation of stars, which dance very perplexingly when the instrument is held in the hand and a high power applied. If a stand cannot be afforded, the sun is far the best object to observe with a reflecting instrument. It is always supposed that the observations are made for several minutes before and after the meridian passage, and the time noted for computing the reduction to the meridian. The meridian altitude of the sun, such as it would be if observed on the meridian and freed from instrumental and other errors, is then computed, and as the longitude of the place is known, at least approximately, the declination of the sun at its passage over that meridian may be computed from the 'Nautical Almanac.' The meridian altitude + the south declination of the sun, or − the north declination, is, in the northern hemisphere, the colatitude of the place. With Troughton's circle, the limbs are alternately observed, to get rid of the sun's diameter, and the number of observations, forwards and backwards, should be equal, so as to get rid of the index error. With the repeating reflecting circle, the observations should also be of the upper and lower limbs alternately, and should be carried quite round the circle, so as to get rid of excentricity. In the sextant the index error should be carefully determined before and after each day's observations, and the alternate limbs observed exactly as with the circles. There is however no way of getting rid of excentricity in the sextant by observing one object, and any fault in determining the index error will vitiate the latitude to half its amount. While the circles will probably give a latitude to nearly 5″, with a very careful series of observations of the sun, the sextant used with equal care might be out 10″ or 15″. It is evident therefore, that where accuracy is an object, the observer ought, if possible, either to use a circle or to mount the sextant upon a stand, and observe stars as we have above described. It is an additional reason to carry a stand, when practicable, that in low latitudes the sun cannot be observed at all for the latitude, nor any object which is elevated 65° or 70°. In this case stars must be used; and without a stand, the observation, using high magnifying powers, is difficult and unsatisfactory. In speaking of the horizon we always mean a mercurial horizon, except another is specified. The glasses of the roof should be truly plane and parallel, but by reversing the horizon for half the observations any error of this kind is destroyed. The mercurial horizon is unfortunately heavy and inconvenient, and troublesome from its tremors wherever there is any motion. Several substitutes have been used. Oil or treacle has been adopted with good success where the shaking from carriages, &c. has prevented the use of mercury. Sometimes a piece of glass is set horizontal by a level applied to its surface, or by a fluid below it, so as to get a reflecting surface, but these generally absorb too much light to be used conveniently for stars, and are not very trustworthy. The best substitute seems to be a piece of speculum metal, ground plane, and laid horizontal by a level. It is certainly the brightest, and therefore the best for stars, but it must be remembered that horizons which are not self-regulated, by being fluid, are scarcely to be trusted under a hot sun. Troughton's reflecting circle is rather heavy, and reading three verniers for every observation is troublesome, especially at night, but it is very accurate, and fewer observations are required. Borda's reflecting circle may be made much smaller and lighter, but demands the most exquisite workmanship, a greater number of observations, and more reduction. The simple sextant is more manageable, but requires greater precautions and checks in its use. But with any of these a skilful observer will get the latitude very nearly. Sextants are made of all sizes from 10 inches radius (which is probably not so good as 8 inches) down to the snuff-box sextant of 1½ inches radius. For travellers who cannot afford to carry much weight, the 3-inch sextant is very convenient. In a recent communication to the Royal Astronomical Society, Mr. Lassell states, that with a 3-inch sextant made by Dollond, which packs up, stand, horizon, and all, in a box 4·3 inches square and 2·7 deep, he found that he could get the latitude within 10″, and the time to 1ˢ.0 by observations of stars. The horizon was of speculum metal, ground by himself, and set true by a level. The observations sent with the account completely justify Mr. Lassell's opinion, but one observer differs more from another in sextant observations than in any other class of astronomical instruments; with the snuff-box sextant, altitudes may be got within 1′. The state of the barometer and thermometer must be noted at the time of all observations for the latitude, in order to compute the true refraction. At the same time we may remark, that if the observations be *balanced, i.e.* if the altitudes to the north have nearly corresponding altitudes to the south, the refraction will affect the observations like an instrumental error, and the variations depending on the barometer and thermometer will be quite insensible.

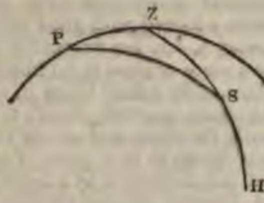
5. Observations of Polaris may be taken at any time for the latitude, and there are tables for *approximate* reduction given in the 'Nautical Almanac' for each year.

6. At sea the sextant is the only instrument which can be used, and the latitude is generally got by observing the altitude of the sun's lower limb when on the meridian, above the sea horizon. This is rather a rude process, but the resulting latitudes are generally true to 1′, or at worst to 2′. The moon, since 1834, the date of the improved and extended 'Nautical Almanac,' may be very conveniently used for finding the latitude at sea, and the brighter planets and stars are often observable on the meridian. The latitude may also be deduced from two altitudes of the sun, and the time elapsed between the observations, or indeed from any two altitudes of two known celestial bodies, one of which is near the meridian, and the other distant from it, as persons not acquainted with spherical trigonometry may satisfy themselves on the celestial globe. There is a considerable difficulty in seeing the sea horizon by night, which is somewhat reduced by getting as near the level of it as you can.

Determination of the Longitude.—The determination of the longitude of any place on the earth's surface, astronomically considered, resolves itself into two parts, the finding the time at the place of observation, and finding the time, at *the same moment,* on the first meridian (we shall always speak of Greenwich), or at any place the longitude of which from Greenwich is well known. It will be more convenient to classify the methods of finding the longitude by the phenomena than by the instruments.

Determination of Time at the Place.—1. This is best and most easily done by a transit instrument, and the time, when found, is kept by a clock or chronometer. [TRANSIT.] The transit however is neither a very portable instrument, nor is a proper situation for it, we mean one sufficiently steady, readily found.

2. The time can also be found from the altitude of the sun, planets, or stars out of the meridian. Thus let P be the pole,



Z the zenith, and Z S the zenith distance, or S H the altitude of any heavenly body, the right ascension and declination of which are well known, and consequently the polar distance P S. From these data and P Z the co-latitude of the place, the angle Z P S can be computed, called the hour angle, and this, if the body be the sun, and to the west of the meridian, is the *apparent* time after noon; or if the sun be to the east, the hour angle is the *apparent* time before noon. This apparent time is easily reduced to *mean* time with the data of the 'Nautical Almanac.' When the object observed is a planet or star, the hour angle being added to the right ascension when the body is to the west, or subtracted from the right ascension when the body is east, will give the sidereal time, which can be reduced to mean solar time with only an approximate knowledge of the longitude. The problem therefore of finding the time consists generally in observing the altitude or zenith distance of any known object, and determining the hour angle from it. The repeating or altitude and azimuth circles are very fit for this purpose, but the most usual and portable instrument is a reflecting circle or sextant with its horizon and a chronometer. The observations of altitude should be made as much as possible on the prime vertical, *i.e.* when the object is east or west. Again, to get rid of instrumental error, and also to save computation, the sun should be observed, when convenient and possible, at the same altitude morning and evening. We should also recommend when the sun is observed that both limbs should be observed without moving the index. For instance, if in the morning the sun were about 14° high, set the instrument to 30°, note the instant when the upper limb by reflection touches the upper limb seen in the horizon, read off the angle very carefully, wait till the lower limbs form their contact, and note the time. Then set to 31° 30′ or 32° and proceed as before, and repeat the operation, having again set forward 1° 30′ or 2°. The observer has then several checks without trouble, for the times in which the sun rises through a diameter will be sensibly equal or vary uniformly; and in like manner the times of rising through 1° 30′ or 2° will point out if any of the usual errors have been committed. In the afternoon the same process should be repeated in an inverse order, and the time of apparent noon deduced from each pair.* It is to be understood as a universal rule, that the index error is to be carefully determined, and the barometer and thermometer noted whenever observations of altitude for time or latitude are made.

3. The same mode of observing equal altitudes might be applied to stars, but the observations would be extended to very inconvenient hours, and it is *nearly* as accurate to observe two bright stars, one to the east and the other to the west, and if possible at about the same altitudes. Each star will then give an error of the chronometer, and if the altitudes are rightly observed, the *same* error of the chronometer. If the errors do not agree, a mean will come nearer to the truth than either of them separately; but if the stars have not the same polar distance, the effect of a given error in altitude upon the hour angle must be computed for each, and the difference between the chronometer's errors divided in this ratio. Thus, suppose the eastern star gives a chronometer error of $25^{s}.0$ fast, and the western star an error of $28^{s}.0$ fast, while an error of 1′ in the altitude of the eastern star causes twice the error in the deduced hour angle that a similar error of 1′ does in the western star; the concluded true error should be $27^{s}.0$, instead of the mean error $26^{s}.5$. The reader will see that if the observations are made at exactly the same altitude, any mistake as to the index error, refraction, or any instrumental defect, is thus got rid of without much trouble. But, as has been mentioned before, very perfect observations of stars with reflecting instruments can scarcely be made unless the instrument is mounted on a stand. From good sets of observations of a star east and a star west, the time may be determined to $0^{s}.3$ or $0^{s}.4$. The time is required to reduce circum-meridian observations to the meridian for finding the latitude, and again the latitude is required in order to deduce the time from altitudes. An approximate latitude, such as results from the largest observed altitude about the meridian, will give the time near enough for the reduction to the meridian, and then the time may be computed rigorously with the exact latitude. Provision may be made for this revision by taking out the differences of the logarithms at each step of the first computation; but generally speaking, when the altitudes for time are taken near the prime vertical, as they ought to be, a small error in the latitude has so little effect on the hour angle, that the approximate latitude is near enough.

Determination of Greenwich Time astromically.—1. There are two phenomena which are seen at the same moment from whatever part of the earth they are visible, viz. a lunar eclipse and the eclipses of Jupiter's satellites. The first was the only phenomenon from which longitudes were derived previous to the invention of telescopes, but it is not of frequent occurrence, and unfortunately cannot be noted very exactly. It has been proposed to measure equal quantities of the eclipse on each side of the middle, and formerly astronomers were very careful to note the moments when the umbra touched or covered well-defined spots. But at present, lunar eclipses are scarcely regarded, as there are many more accurate means of determining the longitude, and of more frequent occurrence; and lunar eclipses are of no value in the theory of the moon's motions. The eclipses of the satellites of Jupiter, especially of the first satellite, are much more common, and have been of great use in modern geography. The time at which the eclipses take place, *i.e.* when the satellite, passing into the shadow of Jupiter, is lost (immerges), or passing out of the shadow, becomes visible (emerges), are set down in the 'Nautical Almanac' at the time they would be seen at Greenwich if visible. The observer at any other place notes when this phenomenon does actually happen at the place of observation, and the difference between the two times is the longitude of the place from Greenwich; east if the time of the eclipse is later than at Greenwich, and west if it be earlier. Unfortunately this method, so easy in practice, is by no means as accurate as it might at first sight appear. The theory of the satellites is scarcely to be considered as perfect, but this objection might be obviated by comparing corresponding observations, and might be very much diminished by correcting the predictions of the 'Nautical Almanac' by observations made at Greenwich, or any other well known place, about the same time. But the phenomenon is a gradual and not an instantaneous one, and the appearance or disappearance of the satellite varies greatly with the goodness of the telescope, the eye or mood of the observer, the atmosphere at the place of observation, &c., so that a longitude deduced from an eclipse of the first satellite may be considerably wide of the truth. With ordinary telescopes we believe that eclipses of the second satellite are more than twice as uncertain as the first, and that the third and fourth satellites are not worth observing for this purpose, being much inferior to good lunar distances. A large mass of eclipses of Jupiter's satellites made by the same telescope and the same observer, and where the immersions are nearly as numerous as the emersions, will however yield a satisfactory result. The aperture of the object-glass employed, and also the sight of the observer, should correspond as nearly as possible with the telescope and observer at Greenwich, or whatever place is adopted as a standard of comparison. It is not considered advisable to use a smaller telescope than an achromatic of 2¾ inches aperture for this purpose, or one larger than of 3½ aperture.

2. The time at Greenwich is most accurately determined by solar eclipses or occultations of fixed stars by the moon.

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* There are tables for this purpose in Schumacher's 'Hülfstafeln,' and in many sets of tables.

ıutations are rather long, but not very difficult or
The beginning and end of the solar eclipse
observed; the latter is the better marked pheno-
ıd if the eclipse be annular, the commencement
ing up of the annulus. Recent observations have
ıt these appearances are not instantaneous, and
that longitudes deduced from them are not free
ertainty. The occultation of a fixed star by the
ɔt liable to this objection; and when the star is
l both immersion and emersion can be carefully
:he longitude from an occultation affords perhaps
letermination possible of the longitude between
ıt places. Yet even here doubts may arise, at
me cases. The star may be occulted too early by
ountain, or disappear too late in a lunar valley.
tation should be observed at both places, which is
ossible, and the star should pass not far from the
he moon. If the solar eclipse or the occultation be
ed at Greenwich, or at any well determined obser-
data of the 'Nautical Almanac' must be cor-
the meridian observations of the moon about the
tables of the sun are at present nearly as per-
servation can make them, but the moon may be
even 20″, which might occasion an error of 30s
the deduced longitude, or from an eighth to a
. The solar eclipses, &c., with a map showing
rts of the globe they are visible, are given in the
Almanac,' and the occultations by the moon of
tars to the sixth magnitude inclusive, visible at
, are also predicted to the nearest minute, with
cription of the relative situation of moon and star
ıble any one to observe them without difficulty.
le occultations of fixed stars to the fifth mag-
clusive, visible anywhere, are also set down
luable work, with the data necessary for de-
whether they are visible at any specified
e cannot press too earnestly on all persons inte-
perfecting geography, the absolute necessity of
observe an occultation, and to take altitudes
lly with a circle or sextant. The computations
ade at home. It is mortifying to see how very
been done by English travellers for the exact
ion of places on the earth's surface, and to know
e time how little talent and how small an appa-
required for making excellent observations.
n we have shown abundant zeal and courage, but
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of our geographical researches, and in the ob-
ected, which ought to be remedied.

ısits of Mercury over the sun are rare, and the
derivable from them not very accurate.

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ian passage of the moon's bright limb, and
which are near her parallel of declination.
utical Almanac' contains a list of the stars
be observed with the moon, and also the va-
' the moon's R. A. in one hour of longitude, for
the longitude.* When the place of observation
y near Greenwich, the computation is very simple,
ransit is nearly in the meridian and the moon is
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om the neighbouring stars, and the transit of the
ected for this error, and for the rate, if sensible.
e be to the east of Greenwich, the R. A. of the
ss; if to the west, the R. A. is greater than at
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ınd at Greenwich, and dividing by the variation
ır of longitude, you have the longitude of the
r W. in hours and decimals of an hour. But this
ıires correction when the corresponding observa-
reenwich, Cambridge, Edinburgh, &c., can be
for the R. A. of the moon may be erroneous more
rom the imperfection of the lunar tables, and the stars may not be perfectly well determined, though that fault is daily disappearing. By using the R. A. of the moon and stars *observed* at Greenwich, the longitude will not be affected by the errors of the tables. It is pretty much the same thing, and at times more convenient, to let the former computation stand, and to compute the longitude of Greenwich, Cambridge, &c., from the observations respectively made there, taking care to note the signs of the resulting longitudes. Then if the longitudes of the known and of the unknown place are both east or both west, the difference will be the true longitude of the unknown place, east or west of the known one. Some telescopes give a larger image of the moon than others, and its apparent diameter is affected by varying the aperture of the object-glass. The resulting errors in the longitude are got rid of by observing the second limb as often, if possible, as the first, and then, keeping the results separate, by taking a mean of the two. There is a mistaken notion among many observers, that there is no need to care for the position of the transit. Now any considerable error in the position of the transit does occasion an equivalent error in the longitude, and though it can be corrected, if there are data for determining the want of adjustment, this gives some trouble in the computation. It is so easy to place a transit very nearly in the meridian, and to adjust it in every respect, at least approximately, that there is no excuse for carelessness in this respect. The observer should always take the transits of a star near the pole, and of all Greenwich stars above and below the moon which pass about the time of her culmination, and it is proper to reverse the instrument on alternate nights. When the place of observation is very distant from Greenwich, it will be necessary, until the quantities *a*, *b*, *c*, *d*, mentioned in the note, be computed, to take a little more trouble. The approximate longitude is calculated as before, and then the R. A. of the moon's bright limb must be computed for the corresponding Greenwich time, from the R. A. of the moon for every hour; the moon's semidiameter in R. A. must also be computed. We have found it on the whole most intelligible, and therefore most safe, to compute the R. A. of the moon's bright limb on two hypotheses of longitude, one the minute above and the other the minute below the approximate value. These results are to be corrected by the Greenwich or other observations for the error of the lunar tables, and then, by simple proportion, the correction is determined for one of the hypothetical longitudes. This is rather a long process, but it is strictly accurate, and the steps are intelligible as the computer proceeds. The method of determining the longitude by transits of the moon and stars is the best for places very distant in latitude or longitude, where the same occultations cannot be seen. It is nearly as good for the most distant as the nearest place, the variation of the error of the lunar tables being the only additional cause of inaccuracy, and the phenomenon presents itself very often. It does however require a very nice and well fixed instrument and a careful observer, as 1s error in observing the R. A. of the moon will cause an error of nearly 30s in the resulting longitude, or $\frac{1}{8}$ of a degree. A considerable mass of observations of both limbs corrected by corresponding observations will scarcely be more than 2s or 3s wrong.

4. But where a transit instrument cannot be carried, or cannot be used, as at sea, the longitude must be found *astronomically* by the distance of the moon from the sun, planets, or fixed stars, measured with a reflecting instrument. This apparent distance is reduced to the true distance, *i.e.* such as it would be, seen from the centre of the earth, and as these distances are computed and set down in the 'Nautical Almanac' for every three hours Greenwich time, as they would be seen from the same place, the Greenwich time corresponding to the time of the observation can be calculated. But the time at the place is always supposed to be known from observation, and hence the difference gives the longitude. The longitude may be determined on shore by lunar observations, and, if a stand be used, with much greater accuracy than at sea. All ships and travellers ought to be well supplied with chronometers, *i.e.* the means of keeping their Greenwich time when by observation they have got it, and then the result of the observation and computation is simply stated to be the error of the chronometer on Greenwich time. The chronometer, if the rate be pretty well known, continues to give the Greenwich time (the correction for error and rate being applied) for several days; and the longitude is found every day, by comparing the

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ta might perhaps be further extended with advantage. Suppose
he moon's bright limb on the meridian of Greenwich to be *m*; on
of any other place the longitude of which is required, *m*′; the longi-
ace to be *l*, + when West, and — East; then *m*′ can be thus ex-
$m + al + bl^2 + cl^3 + dl^4$, where *a*, *b*, *c*, and *d* can be previously
eing in decimals of a day. The approximate value of *l*, from the
$\frac{'-m}{a}$. Substituting this value for *l*, let the sum of the other
n the exact longitude $= \frac{m'-m}{a} - \frac{s}{a}$.

actual time at the place of observation with the Greenwich time at the same moment, given by the chronometer. We have spoken as if one chronometer alone were used, but it is mere folly to rely upon one or even two chronometers in a ship, or in important geographical researches.* These are to be compared from day to day, to ascertain that they are not suddenly altering their rates, and also whenever any astronomical observation is made which determines the Greenwich time (for that gives the error of each of the chronometers), or the time at the place. In reducing observed lunar distances to the true lunar distances, the altitudes of the sun and moon, or moon and stars at the time of observation are required, and at sea two observers are commonly set to measure these altitudes at the moment the lunar observer gives a signal that he has made the contact; indeed a fourth person is sometimes engaged in noting the chronometer. On shore this profusion of aids cannot always be obtained, nor are they at all wanted. If the time at the place and the latitude be known, the altitudes may be computed, or the observer may proceed thus: 1st, an altitude of the sun, planet, or star; 2ndly, an altitude of the moon's bright limb; 3rdly, three lunar distances: 4thly, a second altitude of the moon; and 5thly, a second altitude of the star or sun, noting the chronometer at each observation. He will then have the means, by simple proportion, of reducing the altitudes to what they would have been at the time of observing the lunar distances.

We should advise observers, who are properly furnished with chronometers, rather to make a large number of observations on a few favourable nights, than to take a few observations on many nights. By observing several lunar distances on both sides of the moon, and from all the stars and planets east and west given in the 'Nautical Almanac,' the errors of the instrument may be in a great measure eliminated, and the error of observation much diminished. It is evident that if two equal distances are taken, one east of the moon and the other west, then any error of the instrument, such as erroneous index error, want of parallelism in the glasses or telescope, excentricity, &c., would be the same in each, and therefore could be got rid of. In like manner, if two observations on the same side of the moon give different longitudes, it is clear that the instrument has some error which is *not* index error. On this subject we shall have occasion to speak again in treating of the sextant. The luni-solar observations are generally preferred by seamen (and they are perhaps the most satisfactory), partly perhaps because the altitude of the sun, by giving time at the place, is immediately applicable to the determination of the longitude. The longitude from lunar distances, however carefully taken, cannot be relied upon to very great nicety. With all appliances, a distance to $10''$, and a longitude to 20^s, or 1-12th of a degree, can scarcely be considered as certain, and the errors of the lunar tables will not unfrequently double this error. At sea it would not be safe to rely on any series of lunar distances for a less quantity than 1^m of longitude, or 1-4th of a degree, but this is quite sufficient for the purposes of navigation in open seas.

The computation of lunar distances is very easily performed by Thomson's tables, which are exceedingly convenient, and require only a little more extension. They are approximate, but near enough for the navigator and the traveller *en route*. As the last accuracy can only be given to the computations after the errors of the lunar tables are corrected, there is no need of much refinement in the previous work.

It has been proposed to determine the longitude on shore by taking altitudes of the moon with the mercurial horizon; and between and near the tropics the method may be a good one. In these low latitudes the motion of the moon in altitude is nearly vertical and very rapid, and this motion is doubled by observing the distance between the moon and its image seen by reflexion. The bright edge of the moon is a good object in reflecting instruments. The calculation may be made thus:—The time at the place must be most scrupulously determined, and the error and rate of the chronometer known, if possible, by equal altitudes of the sun on each side of noon and midnight. Then the error of the chronometer being known at the place and time of observation, assume an approximate value of the longitude, and determine the Greenwich time, the R. A. and declination of the moon, and its apparent diameter and parallax. Each altitude of the moon will, when properly reduced, give an error of the chronometer, which, if the assumed longitude be correct, will agree with the error obtained by the sun or stars. If there be a difference, a second longitude may be assumed, and thus, as has been shown in speaking of transits of the moon, the terms obtained from which, by a simple proportion, the true longitude can be deduced. It is not improbable that the doubling the motion of the moon in observing by reflexion, and the sharpness of the images, may make up for the error committed in ascertaining and keeping the time, but of this the observer must be the judge.

Determination of Greenwich Time by Chronometers.—Hitherto the Greenwich time has been extracted from astronomical phenomena, but where the distance is not great, the time may be brought from Greenwich by chronometers. Suppose, for instance, the longitude of Madeira were required: then having ascertained the errors and rates of several good chronometers at Greenwich, they are carried to Madeira, and their errors on the meridian of Madeira, and their rates, determined there. The Greenwich time is known from each chronometer, supposing the rate during the voyage to be the mean of the rates before and after, and thus each chronometer gives a longitude of Madeira, and the mean of the whole is taken. The voyage back to Greenwich, in like manner, with the errors and rates on arriving at Greenwich, furnish a second longitude; and if the motion at sea has any tendency to alter the rates, this cause will affect the first determination with a certain error, while it affects the second determination with exactly the same error, but in a different sense. If it increases the difference of longitude one way, it diminishes it the other way. By a mean of several such voyages the difference of longitude of places within a week or perhaps a fortnight's journey may be ascertained with considerable exactness. The best determination of this kind which has come to our knowledge is the difference of longitude between Berlin and Altona. (*Berliner Jahrbuch*, 1839.) There are some precautions to be adopted in determining longitudes chronometrically, which ought not to be neglected. It is well known that two observers will sometimes differ several tenths of a second from each other in getting the time at the same place and with the same instrument. Now this *personal equation*, if it exist between the observers at the two places, will affect the longitude by exactly its amount; hence the observers should be reversed for half the time of the experiment, if possible, or their *relative personal equation* found by comparison with each other, or, at least, with a third person. The accuracy of a chronometrical longitude depends on the distance in time between the places compared and the smoothness of the conveyance. It is decidedly the best mode where the distances do not exceed three or four days' journey, and where there are good carriage-roads or steam-boats. At sea, for voyages of moderate length, the Greenwich time may be taken almost entirely from chronometers, and if the number be considerable, and the watches good, there is little occasion for lunar distances, except for the greater caution, and to be assured against any accident affecting all the timekeepers the same way.

Determination of Greenwich Time by Signals.—Another mode of ascertaining differences of longitude is that of conveying the time from one point to another by fire-signals or rockets. Thus if a rocket is fired from a station between two observatories, and the explosion noted *in the time proper to each place*, the difference between the times will be the difference of longitude. A chain of such signals may be extended a considerable distance thus: Let the two points to be connected be A and B, and let an observer with a chronometer be placed at a, and others with rockets at α, β, thus: A, α, a, β, B. Then the observers at A and B note the rockets from α and β in times of their respective observatories. The person stationed at a notes by his chronometer the rockets at α and β (suppose β at 10 minutes after α), and as he observes α at the same al moment with A, A would see β, if it were visible,) minutes later than he does actually see a, and therehe explosion of β is known in time proper to A's atory; but it is also seen by B at the same moment time, and therefore the difference of longitude is ed. In like manner any number of intermediate s of observers and rockets may be interpolated n two distant points, A and B. The *relative perquation of the observer* at *A and B* must be taken count both as astronomers and observers of signals, personal equation of the intermediate observer does fect the observation. In this way the longitude of rom Greenwich was determined. (*Phil. Trans.*)

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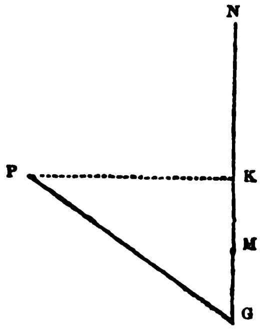
* In the first place chronometers are liable to accidents, and secondly, to change their rates, and that sometimes by jumps. With two chronometers evidence is given of error by their discrepance, and with three, the faulty chronometer may be detected. The best two-day box-chronometers may be bought for 40 guineas, and the best gold and silver pocket-chronometers for 40 and 30 guineas respectively. There is an idle opinion that chronometers are not good pocket-watches. They are perhaps a little more liable to injury *when let fall*, than other watches, on account of the heavy compensated balance, but after wearing chronometers for years without any particular care, we believe that three good pocket-chronometers, not larger than common watches, will keep the time for a month, as well as it can be got by lunar distance.

lly, the longitude and latitude of one place from r may be determined by measurements on the earth's , if the figure of the earth be sufficiently well known. odesical latitudes and longitudes are in many cases not to agree with those found astronomically, owing, supposed, to some variations in the density of the n the neighbourhood of the place of observation. It ever a convenient way of finding the latitude and ide of points near a well-established observatory, and ted by trigonometrical survey.



the distance P G in feet and the bearing K G P of nt P from the observatory G be known by survey, N be an arc of the meridian. Then drawing P K ndicular to G N, P K = P G × sin of P G K and P G × cos P G K, when P K and G K are known, in ind the value of ½ K G in seconds of latitude approxiby supposing 1″ to be = 100·8 feet, and add or subhis, as the case may be, to the latitude of G, which e the latitude of M, the middle point; call this λ. Then ue in English feet of a degree of latitude at M is

$$\cdot 7 + \text{number the logarithm of which} = \begin{cases} 3.5634881 \\ +\ 2 \log \sin \lambda \end{cases}$$

e value of a degree of longitude at the same parallel lish feet =

$$r,\ \log = \begin{Bmatrix} 5\cdot 5625161 \\ +\ \log \cos \lambda \end{Bmatrix} + \text{number}, \log = \begin{cases} 3\cdot 0863668 \\ +\ \log \cos \lambda \\ +\ 2 \log \sin \lambda \end{cases}$$

hese values of a degree of latitude and longitude the es G K and P K are readily converted into arcs of e and longitude.

this subject the reader may consult the 'Encyclo-Metropolitana,' art. 'Figure of the Earth.'

solution of the problems assumed to be known in egoing article may be found in all treatises on astround in most collections of tables of navigation. We ecommended Thomson's 'Tables' as very convenient, fficiently accurate for the traveller and navigator, y tables and methods which a man has become accusto will do. It would require too much space to give s and explanations for the opinions here advanced, will give two or three recommendations which few ers will regret to have followed. The first is to make, practicable, large masses of careful and unhurried ations, and especially to observe the rules given above llifying instrumental error, by making such obons that a given error will have contrary effects in ult. Secondly, to be very careful in selecting their nents and their timekeepers, which should come from akers, and be carefully tried before starting, espet such temperatures as the traveller may expect to ith. A chronometer which is excellent for a polar exmay be an indifferent watch on the Tigris or in the r of Africa, and *versâ vice*. For any overland expedition three pocket chronometers should at least be taken, and the number must be increased according to the length, the difficulty, and the importance of the journey, and a liberal allowance made for stoppages, changes of rate, accidents, &c.: a belt of half a dozen chronometers would scarcely be felt to be an inconvenience. Lastly, if the traveller's object be chiefly that of determining exact positions, he should be careful to determine the longitudes of all his principal points by solar eclipses or occultations of fixed stars by the moon, if he cannot carry and fix a transit. At these points he should determine the rates of his chronometers for a new departure, and determine as much of the country as circumstances will allow by journeys of ten days or a fortnight, returning to the same place. When the principal points are well fixed (we speak of longitudes, for good latitudes may be got with almost any instrument, or by any person), the chronometers will fix every halting-place where the time is observed, and this may be got in a few minutes any fine night or morning or afternoon; and then the itineraries, compass bearings, marches, &c., and all the loose information on which too much of our geography is founded, will furnish valuable details in the proper place. The necessary apparatus is not very expensive or cumbrous, and with a little practice can be managed by a moderately intelligent and methodical person.

LONGLAND, or LANGELANDE, ROBERT, the reputed author of the 'Visions of Piers Plowman.' He was a secular priest, born at Mortimer's Cleobury in Shropshire, and was afterwards fellow of Oriel College in Oxford. He lived in the reigns of Edward III. and Richard II.; and, as Bale assures us, was one of the earliest disciples of Wicliff. Longland, according to the same author, completed the 'Visions' in 1369, when John Chichester was mayor of London. The poem here named consists of 'XX. Passus' (pauses or breaks), exhibiting a series of dreams supposed to have happened to the author on the Malvern Hills in Worcestershire. It abounds in strong allegorical painting, and censures with great humour and fancy most of the vices incident to the several professions of life, and particularly inveighs against the corruptions of the clergy and the absurdities of superstition; the whole written, not in rhyme, but in an uncouth alliterative versification. Of the 'Visions of Piers Plowman' there are two distinct versions, or rather two sets of manuscripts, each distinguished from the other by peculiar readings. Of one, no fewer than three editions were printed in 1550, by Robert Crowley; and one in 1561, by Owen Rogers, to which is sometimes subjoined a separate poem, entitled 'Pierce the Plowman's Crede,' a production of a later date than the 'Visions,' inasmuch as Wicliff, who died in 1384, is mentioned (with honour) in it as no longer living. Of the other version of the 'Visions,' the only edition is that published by Dr. Thomas Dunham Whitaker, 4to., London, 1813, who, in the following year, republished the 'Crede,' from the first edition of that poem printed by Reynold Wolfe, in 1553.

(Bale's *Script. Illustr.*, 4to., Bas. 1559, cent. vi., p. 474; Percy's *Reliques*, edit. 1794, ii. 272; Ellis's *Specim. of Engl. Poet.*, i. 147; Whitaker's edit. of *P. Plouhman, Introd. Disc.*)

LONGOBARDS, LONGOBARDI, or LANGOBARDI, a nation of antient Germany, mentioned by Tacitus (*German.*, 40) as a tribe of the Suevi: he describes them as few in number, but secured by their bravery against their more powerful neighbours. It appears that they lived east of the Elbe, towards the shores of the Baltic Sea. Warnefridus says that they came originally from Scandinavia, and that their name was Viniles, which was afterwards changed into that of Langobards, from two Teutonic words, *lang* and *bart*, 'long-beards.' The Longobards joined Arminius against Maroboduus, king of the Suevi. (Tacit., *Annal.*, ii. 46.)

During the third and fourth centuries of our æra the Longobards followed the general movement of the northern nations towards the south, and came to the banks of the Danube, where we find them acting as allies of Odoacer, king of Italy, whose dominion extended also over Noricum, and bordered on the region then occupied by the Longobards. The Longobards afterwards totally defeated and almost exterminated the Heruli; and about the middle of the sixth century they occupied part of Pannonia, under their king Audoin. Here they came in contact with the Gepidæ, a nation settled in Dacia, on the borders of the

Eastern empire, and which the Longobards, with the assistance of the Avari, a tribe of the Hunni, totally defeated. [Alboin.]

In the year 568 Alboin crossed the Julian Alps, near Forum Julii, and led the Longobards to the conquest of the plains of North Italy, which have ever since been called by the name of the conquerors. [Lombardy.] Pavia became the capital of the Longobards. Together with the Longobards there came into Italy thousands of men of other tribes, which followed the standard of Alboin, namely, Saxons, Suevi, Gepidæ, Bulgarians, Pannonians, Sarmatians, and others. (Warnefrid., b. ii., ch. 26.) After Alboin's death the chief of the Longobards elected Clefo as his successor, A.D. 573; but on his being murdered by a servant, eighteen months after, the nation became divided among a number of dukes, a duke of Ticino or Pavia, a duke of Friuli, a duke of Trento, a duke of Bergamo, a duke of Brescia, besides thirty dukes in so many other cities. Under these dukes the Longobards penetrated south of the Apennines, and conquered Tuscany, Liguria, Umbria, and part of Campania. The Byzantine emperors retained Ravenna, Rome and its duchy, Padua, Genoa, Apulia, Calabria, Naples, and the southern extremity of Italy with Sicily. 'The government of the dukes,' says Warnefrid, 'was very oppressive to the Roman or native inhabitants, many of whom were put to death, and the rest deprived of part of their property, and obliged to pay tribute for the rest.' After ten years of this disorderly dominion of the dukes, the Longobards chose for their king Autaris, son of Clefo, 586—592. His reign was prosperous: he repulsed the attacks of the Franks on one side, and of the Byzantines on the other; and he carried his arms into southern Italy, where he founded the dukedom of Benevento. After the death of Autaris, his widow Theodolinda, who was a daughter of the king of Boiaaria, or Bavaria, married Agilulfus, duke of Turin, who was acknowledged by the Longobards as their king. Agilulfus, through the persuasion of his wife, became a Catholic, most of his countrymen being Arians, and made peace with Gregory the Great, bishop of Rome. Theodolinda built the church and palace of Monza, where was deposited the iron crown (so called from a nail, said to be from the cross of our Saviour, which is riveted inside of the crown), which has served ever since for the coronation of the kings of Lombardy. Agilulfus took Cremona, Padua, and other towns which still sided with the Eastern emperor. Truces were repeatedly made between the Longobards and the Byzantines of Ravenna. Agilulfus died in 615, and was succeeded by his son Adaloaldus, under the regency of Theodolinda. Adaloaldus, ten years after, having lost his mother, was deposed, as the chroniclers say, because he was insane, and Ariovaldus was elected in his stead. Little or nothing is known of Ariovaldus, except that he reigned twelve years, and died A.D. 636. It was under his reign that Columbanus, the Irish monk and missionary, after passing through Helvetia and Rhætia, came into Italy and founded the monastery of Bobbio, near the Ligurian Apennines, which afterwards became celebrated for its wealth and its collection of MSS.

Aftor the death of Ariovaldus, Rothar, son-in-law of Agilulfus, was elected in his place. Rothar was the first who made a compilation of the unwritten laws and usages of the Longobards, and published them in a kind of barbarous Latin, under the name of Edict, with his own preface and observations. This edict drew a marked distinction between the Longobards and the Roman or subject population, which continued to live under the Roman law. The distinction between the two races, the conquerors and the conquered, seems to have continued until the fall of the Longobard dominion. By a subsequent law of King Liutprand, who made considerable additions to the edict of Rothar, it was enacted that if a Roman married a Longobard woman, the children born from such a marriage were Roman, and followed the condition of the father. The laws of the Longobards resembled in their spirit those of the Burgundians, Franks, and other Teutonic races. Pecuniary compensation was awarded for most personal injuries, assaults, wounds, mutilation, and for homicide. Adultery and theft were punished with death. Emigration was forbidden, and sedition or mutiny was a capital crime. The judges were strictly warned against partiality or corruption, and enjoined to decide causes within a limited number of days. Single combat or duelling was tolerated, though its practice was characterised by Liutprand as absurd. Upon the whole, the laws of the Longobards were among the most rational and equitable of those of the northern nations which divided among themselves the ruins of the Western empire, and as such have received the commendation of Montesquieu, Gibbon, Johann Müller, and others.

With regard to the political system of the Longobards, it may be considered as a federation under an elective king, who was the chief of the nation, something like the subsequent confederation of the German empire. When Autaris was elected king, the dukes in a general assembly agreed to give one half of their revenues for the support of the royal office and state, but in other respects they acted as sovereigns in their respective duchies, each making wars and conquests on his own account, as appears by the chronicles and also by the letters of pope Gregory the Great. We find a duke of Benevento extending his conquests as far as Cotrone, the dukes of Spoleti taking several towns of Sabina, and the dukes of Friuli repeatedly engaged in deadly warfare against the Avari and Sclavonians, without the rest of the Longobards, or the king himself, intervening as parties in these quarrels. The orders and enactments of the king required the sanction of the people, or army (for the two words are used as synonymous) of the Longobards. The king was supreme judge and commander, but not absolute legislator. These relations were maintained with tolerable fairness among the Longobards themselves, but with regard to the treatment of their Roman subjects the case was somewhat different. Several modern writers, Giannone, Muratori, Denina, Bossi, and others, have considered the Italians, or 'Romans,' as they were called, under the Longobard dominion, as enjoying equal privileges with their Longobard masters; but Manzoni, in a very sensible and soberly written disquisition on the subject, has dispelled this delusion. (*Discorso sopra alcuni punti della Storia Longobardica in Italia*, annexed to Manzoni's tragedy of *Adelchi*.)

The 'Roman' or Italian subjects of the Longobards were looked upon as a conquered and subject race, not exactly like the Helots at Sparta, but still they had neither the same political nor civil rights as the conquerors; they had no voice in their assemblies; they had no appeal against the caprice of their Longobard rulers; they lived among themselves according to the Roman law, but in any affairs between them and the Longobards they were judged by Longobard judges and according to the Longobard law.

Rothar, having conquered the towns of the Thuscia Lunensis, or Riviera of Genoa, and defeated the troops of the exarch of Ravenna, died A.D. 653, and was succeeded by his son Rodoaldus, who after five years' reign was killed by a Longobard for having seduced his wife. Aripertus, a nephew of queen Theodelinda, being elected in his place, reigned till the year 661, when he died, and his two sons Pertharitus and Godebertus divided the supreme authority between them. Godebertus however conspired against his brother, who was obliged to run away; but Godebertus himself was killed by Grimoaldus, a chief from Benevento, who took possession of the crown, A.D. 662. Grimoaldus was an able and warlike usurper. He defeated the Franks, who had entered Italy, and had advanced to near Asti. Shortly after, Constans II., emperor of Constantinople, and grandson of Heraclius, having landed with an army at Tarentum with the intention of recovering Italy from the Longobards, took Luceria, and laid siege to Benevento, of which Romualdus, son of Grimoaldus, was duke. Grimoaldus marched with an army to the assistance of his son, and obliged Constans to raise the siege and retire to Naples. Constans afterwards went to Rome, which was still subject to the Eastern emperors, and took away the ornaments of the churches. He then retired by the way of Reggio to Sicily, where he committed many acts of oppression, until at last he was smothered in the bath at Syracuse, A.D. 668. All the records of those times concur to show that those provinces of Italy which were still subject to the Byzantine emperors were much worse governed than the dominions of the Longobards. Under the reign of Grimoaldus, Alseco, or Alseck, a chief of Bulgarians, emigrated to Italy with all his tribe, and put himself under the protection of the Longobard king. The king sent him to his son the duke of Benevento, who assigned to him the towns and territories of Boianum, Sæpinum, Æsernia, and other places in the country of Samnium, which had remained desolate in consequence of the wars. Warnefridus (b. v. ch. 29) adds that the descendants of those Bulgarians continued there in his days, 'and although they spoke Latin, had not lost the use of the language of their ancestors;' a remarkable passage, which shows that the general language of Italy in the time of Charlemagne was still the Latin, and was adopted by the northern tribes which settled in the country.

Grimoaldus added several chapters of laws to the edict or compilation of Rothar, and after a successful reign of nine years died at Pavia, A.D. 671. After his death the exile Pertharitus, who had wandered as far as England, returned, and by universal consent resumed the crown. Pertharitus reigned seventeen years, and died in 688, leaving his son Cunipertus, who had married Ermelinda, an Anglo-Saxon lady. Cunipertus was driven away by Alachis, duke of Tarentum, but he returned, defeated and killed Alachis, and resumed the crown. In the meantime Romualdus, duke of Benevento, took Tarentum and all the neighbouring country from the Byzantines, and annexed it to his dominions. Cunipertus died in the year 700. His infant son Linpertus was put to death by Aripertus, duke of Turin, who assumed the crown. Asprandus, whom Cunipertus had appointed guardian to his son, fled into Boiaria with Liutprand, the son of Asprandus. Nine years afterwards they returned at the head of an army of Bavarians, and after a battle, in which Aripertus was drowned in attempting to cross the Ticinus, Asprandus was acknowledged king of the Longobards; he died soon after, and his son Liutprandus succeeded him by common consent, A.D. 713.

Liutprandus reigned thirty-two years. He was the most illustrious of the Longobard kings. He took Ravenna and the Pentapolis, but afterwards made peace with the Byzantines and restored Ravenna, was friendly with the pope Zacharias and the people of Rome, who at that time were alienated from the Eastern emperors in consequence of the schism of the Iconoclasts; and he was also friendly with Charles Martel, to whom he sent assistance against the Saracens, who had entered Provence in the year 739. Liutprand raised many churches and other buildings. 'He was,' says Warnefrid, 'valiant in war, but fond of peace; of a forgiving disposition; although destitute of learning like most of his countrymen, yet gifted with judgment and perspicacity, and worthy of being compared with philosophers; careful of the welfare of his people, and a legislator.' His laws are joined to those of his predecessors Rothar and Grimoald, in the collection of the laws of the Longobards. Liutprand died in 744, and was succeeded by his nephew Hildebrand, who was deposed a few months after for his misconduct, when Ratchis, duke of Friuli, was elected king. Ratchis, after five years' reign, voluntarily renounced the crown, and went to Rome, and afterwards to Monte Casino, where he became a monk. Ratchis was succeeded by his brother Astolphus. The first years of the reign of Astolphus were peaceful as long as Zacharias, a prudent and upright pope, continued to live. After the death of Zacharias, Stephen II. succeeded him, who began to intrigue with Pepin, king of the Franks, who wished to extend his power into Italy. Astolphus, on his side, having taken Ravenna in 751, and put an end to the dominion of the Exarchs, attacked the duchy of Rome, and aimed at subjecting that city also to his authority. Pepin came twice to the assistance of the pope, and each time defeated Astolphus near Pavia, and obliged him to give up Ravenna, the Pentapolis, and other towns, which Pepin is said to have then bestowed upon the Roman see. This donation however has been a subject of much controversy: the instrument does not exist, but is said to have been lost. Astolphus died in 756, and Desiderius, a Longobard duke, was elected his successor. Desiderius renewed the quarrel of Astolphus with the pope, and not only seized the towns given up by Astolphus, but likewise devastated the duchy of Rome. The pope Adrian I. applied to Charlemagne for assistance. Charlemagne came into Italy A.D. 774, defeated Desiderius, and carried him prisoner into France, where he became a monk. Adelchis, son of Desiderius, fled to Constantinople, from whence he returned to Italy with some troops, and fell in battle. The kingdom of the Longobards ended with Desiderius, and the Longobard nation and its territories became subject to Charlemagne.

The political system of the Longobards was weak: 1st, because their king was elective; 2nd, because the state was divided among so many almost independent dukes; 3rd, because it established a degrading inferiority between themselves and the native cultivators of the soil; 4th, because it never could or would enter into a fair alliance with the hierarchy of Rome, whose power was growing very fast in the opinion of the Italians or 'Romans,' both of the Longobard and other territories of Italy. The popes were in fact the protectors and the hope of the degraded Roman population, and this contributes to explain the facility with which Charlemagne in one single battle overthrew the whole dominion of the Longobards.

LONGOMONTA'NUS. CHRISTIAN SEVERIN, better known as Christian Longomontanus, from the latinized form of his native village, Langsberg, in Denmark, was born in the year 1562. His early education was probably wholly due to his own exertions, as the circumstances of his father, who was a poor ploughman, would scarcely have enabled him to incur much expense on that account; but upon the death of this parent, which took place when he was only eight years old, he was sent for a short time to a good school by his maternal uncle. This improvement in young Severin's condition excited so much jealousy among his brethren, who thought themselves unfairly dealt with, that he determined, in 1577, upon removing to Wiborg, where he lived eleven years, 'working by night to earn a subsistence, and attending the lectures of the professors during the day.' After this he went to Copenhagen and there became known to Tycho Brahé, who employed him in reducing his observations and making other astronomical calculations up to the time of his quitting the island of Hoëne in 1597, when he sent him to Wandenbourg, and thence to his residence at Benach, near Prague. His stay here was not of long duration, in consequence, it is said, of his attachment to his native country, though it is perhaps attributable to the death of his patron, which happened in 1601. [BRAHE', TYCHO.] He returned by a circuitous route, in order to visit the place which had been honoured by the presence of Copernicus, and reached Wiborg about the year 1603, where he was appointed superintendent (recteur) of the gymnasium, and two years after was promoted to the professorship of mathematics in the university of Copenhagen, the duties of which he continued to discharge till within two years of his death. He died at Copenhagen, 8th October, 1647.

The following list of his published works is taken from the 18th volume of the 'Mémoires des Hommes Illustres,' Paris, 1732; 'Theses summam doctrinæ Ethicæ complectentes,' 1610; 'Disputatio Ethica de Animæ Humanæ Morbis,' 1610; 'Disputationes duæ de Philosophiæ origine, utilitate, definitione, divisione, et addiscendi ratione,' 1611-18; 'Systematis Mathematici,' part 1; 'Arithmeticam Solutam duobus libris methodice comprehendens,' 1611; 'Cyclometria è Lunulis reciproce demonstrata, unde tam areæ, quam perimetri Circuli exacta dimensio et in numeros diductio secuta est, hactenus ab omnibus Mathematicis unice desiderata,' 1612, 1627, and 1664; 'Disputatio de Eclipsibus,' 1616; 'Astronomia Danica in duas partes tributa, quarum prima doctrinam de diuturna apparente Siderum Revolutione super Sphæra armillari veterum instaurata duobus libris explicat; secunda Theorias de Motibus Planetarum ad Observationes Tychonis de Brahé, &c. itidem duobus libris complectitur,' 1622, 1640, and 1663 (Gassendi, in his Life of Tycho Brahé, says that this work belongs rather to that astronomer than to Longomontanus, since the tables of the planetary motions were either calculated by Longomontanus under the immediate superintendence of Tycho, or copied by him from those which Tycho had previously caused to be computed); 'Disputationes quatuor Astrologicæ,' 1622; 'Pentas Problematum Philosophiæ,' 1623; 'De Chronolabio Historico,' 1627; 'Disputatio de Tempore trium Epocharum, Mundi Conditi, Christi Nati, et Olympiadis primæ,' 1629; 'Zetemata septem de summo hominis bono,' 1630; 'Disputatio de summo hominis malo,' 1630; 'Geometriæ quæsita xiii. de Cyclometria rationali et vera,' 1631; 'Inventio Quadraturæ Circuli,' 1634 (this work gave rise to a very animated dispute between the author and Dr. John Pell, an English mathematician, who proved that the demonstration there given of the quadrature of the circle was fallacious, but notwithstanding Longomontanus died in the conviction that he had effected that which has since been shown to be impracticable); 'Disputatio de Matheseos Indole,' 1636; 'Coronis Problematica ex Mysteriis Trium Numerorum,' 1637; 'Problemata duo Geometrica,' 1638; Problema contra Paulum Guldinum de Circuli Mensura,' 1638; 'Introductio in Theatrum Astronomicum,' 1639; 'Rotundi in Plano, seu Circuli absoluta Mensura,' 1644; 'Energeia Proportionis sesquitertiæ,' 1644; 'Controversia cum Pellio de vera Circuli Mensura,' 1645. (Hutton's *Dictionary*; *Biog. Univers.*)

LONGUS is the name of the author, or supposed author, of a Greek pastoral romance, 'The Loves of Daphnis and Chloe,' or, according to the literal version of the Greek title (*Ποιμενικὰ τὰ κατὰ Δάφνιν καὶ Χλόην*), 'Pastoral Matters concerning Daphnis and Chloe,' which has been generally admired for its elegance and simplicity, and is one of the earliest specimens of that kind of composition. We know nothing of the author, who is supposed to have lived in the fourth or fifth century of our æra. The 'Daphnis' of Gesner approaches the nearest of any modern composition to an imitation of the work of Longus. This pastoral has gone through numerous editions, the best of which are: that of Leipzig, 1777, called 'Variorum,' because it contains the notes of former editors; Villoison's, with numerous notes by the editor, Paris, 1778; Schæfer's, Leipzig, 1803; that of Courier, Rome, 1810; that of Passow, Leipzig, 1811, Greek and German; and by Sinner, Paris, 1829. Courier discovered in the MS. of Longus, in the Laurentian library at Florence, a passage of some length, belonging to the first book, which is wanting in all the other MSS. He first published the fragment separately at his own expense and distributed the copies gratis. He afterwards embodied it in his edition of the whole pastoral, of which he published only 52 copies, most of which he sent to distinguished scholars of various countries. He also republished Amyot's French translation of Longus, adding to it the translation of the discovered passage. [COURIER, PAUL LOUIS.]

LONGWY. [MOSELLE.]

LONS-LE-SAUNIER. [JURA.]

LOO-CHOO ISLANDS. [LIEOU-KIEOU ISLANDS.]

LOOE, EAST AND WEST. [CORNWALL.]

LOON (Ornithology), one of the English names for the Greatest Speckled Diver, *Colymbus glacialis*. [DIVER, vol. ix., p. 37.]

LOP, Lake. [TURKISTAN.]

LOPE DE VEGA. [VEGA.]

LO'PHIADÆ, a family of fishes of the order Acanthopterygii. The fishes of this family (which forms the '*Pectorales Pédiculées*' of Cuvier) are distinguished by the bones of the carpus being elongated and forming a kind of arm, which supports the pectoral fins. The skeleton is semicartilaginous. The family contains four genera: *Lophius* (Cuv.), *Antennarius* (Commerson), *Malthe* (Cuv.), and *Batrachus* (Bloch., Schn.)

The extraordinary fish which is not unfrequently met with on our coast, and known by the name of the Angler (*Lophius piscatorius*, Lin.), is an example of the first of the above genera, which is thus characterized:—Skin without scales; the ventral fins situated in front of the pectorals; opercule and branchiostegous rays enveloped in the skin; gill opening situated behind the pectorals; branchiostegous membrane forming a large purse-like cavity in the axilla; two distinct dorsal fins, in front of which are some free rays produced into long slender filaments: head broad and depressed, extremely large in proportion to the body.

The Angler, or Fishing Frog, as it is sometimes called, is thus described by Mr. Yarrell:—'The head is wide, depressed; the mouth nearly as wide as the head; lower jaw the longest, bearded or fringed all round the edge; both jaws armed with numerous teeth of different lengths, conical, sharp, and curving inwards; teeth also on the palatine bones and tongue; three elongated unconnected filaments on the upper part of the head, two near the upper lip, one at the nape, all three situated on the middle line; eyes large, irides brown, pupil black; pectoral fins broad and rounded at the edge, wide at the base; branchial pouches in part supported by the six branchiostegous rays. Body narrow compared with the breadth of the head, and tapering gradually to the tail; vent about the middle of the body; the whole fish covered with a loose skin. The number of fin-rays are:—dorsal, 3 spinous and 12 soft; pectoral, 20; ventral, 5; anal, 8; and caudal, 8. Colour of the upper surface of the body uniform brown; fin membranes darker; under surface of the body, ventral and pectoral fins, white; tail dark brown, almost black.'

The Angler is usually about three feet in length, but has been known to measure five. It lives at the bottom of the water, crouching close to the ground; and, by means of its ventral and pectoral fins, it stirs up the mud and sand in such a manner as to conceal itself from other fishes. The long filament at the tip of the nose is elevated, and the glittering appendage at its extremity is said to attract the smaller fishes as a bait; and when they are sufficiently near, they are seized by this voracious fish.

In the genus *Antennarius* there is the same sort of free rays on the head, the first of which is slender, often terminated by an appendage; the following rays, augmented by a membrane, are sometimes much enlarged, and at others are united to form a fin. The dorsal fin occupies nearly the whole extent of the back; the body is often beset with cutaneous appendages. These fishes, says Cuvier, by filling their enormous stomachs with air, expand themselves like a balloon; their fins enable them to creep on land, where they can live for two or three days, the pectorals, from their position, performing the functions of hind feet. These fishes inhabit the seas of hot climates.

The species of the genus *Malthe* are remarkable for their projecting snout, beneath which the mouth, which is of moderate size and protracted, is situated. The body is studded with bony tubercles, and the dorsal fin is small.

The fourth and last genus of the present family (*Batrachus*) is distinguished by the following characters:—Head horizontally flattened, broader than the body; the mouth deeply cleft; operculum and suboperculum spinous; the ventral fins narrow, inserted under the throat, and containing but three rays, the first of which is broad and elongated. The anterior dorsal fin is short, and supported by three spinous rays; the posterior dorsal is long, and supported by soft rays; the anal fin, which is opposed to the last, is also supported with soft rays. The lips are frequently furnished with filaments. The species of this genus keep themselves hidden in the sand to surprise their prey, like those of the genus Lophius, and the wounds inflicted by their spines are said to be dangerous.

LO'PHIODON, an extinct genus of mammiferous quadrupeds nearly approaching in the structure of the teeth to the Tapirs and Rhinoceroses, and in some respects to the Hippopotamus, separated by Cuvier from *Palæotherium* (with which, as well as *Anoplotherium*, it is closely connected) under the name at the head of this article. M de Blainville named the genus *Tapirotherium*.

Lophiodon differs from *Palæotherium* in that the lower molar teeth, instead of exhibiting a continuous series of double crescents running longitudinally, have transversal elevations (des collines transversales), more or less oblique. Cuvier gives the following as the generic characters of *Lophiodon*:—

1. Six incisors and two canines in each jaw; seven molars on each side of the upper jaw and six in the lower, with a vacant space between the canine and the first molar: points in which they resemble the Tapirs.

2. A third elevation (colline) on the last lower molar, which is wanting in the Tapirs.

3. The anterior lower molars are not furnished with transversal elevations as in the Tapirs, but present a longitudinal series of tubercles, or a conical and isolated one.

4. The upper molars have their transversal elevations more oblique, and in this respect approach the Rhinoceroses, from which they differ by the absence of *crochets* on these elevations.

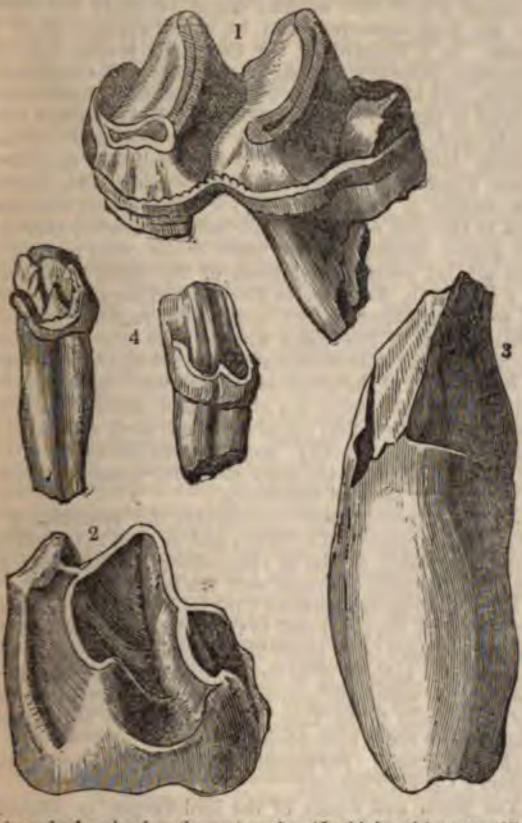
The dental formula of *Lophiodon* then will be:—

$$\text{Incisors } \frac{6}{6}; \text{ Canines } \frac{1-1}{1-1}; \text{ Molars } \frac{7-7}{6-6} = 42.$$

The rest of the osteology of this extinct form indicates the affinities above mentioned; but many parts of the skeleton are still unknown, and particularly those essential portions the nasal bones and those of the feet, the number of toes not being ascertained.

No less than fifteen species are recorded, twelve of which are named. They belong to the first great fresh-water formation of the Eocene Period of Lyell; and if we are to judge from analogy, and the other animal remains (those of reptiles especially) with which they are associated, they must have lived in a temperature suitable to the existence of Crocodiles and fresh-water *Testudinata* (*Emys* and *Trionyx*), creatures which, at present, inhabit warm climates.

The localities are Issel for three species, one of which is also found at Epplesheim and another also at Argenton and Soissons. Argenton for three other species. Buchsweiler for two more. Montabusard for two more, one of which is also found at Gannat. Boutonnet near Montpellier for one. Orenburg,[*] for one (*L. Sibiricum* of Fischer): these species are named. Others have been found at Argenton, in the Laonnois, near Paris, and near Frankfort.



1, lower back molar, from the great species of Lophiodon of Argenton. (Cuv.) 2, upper molar (back) of the same. (Cuv.) 3, canine tooth of the same. (Cuv.) 4, incisor teeth of the same. (Cuv.)

In the 'Règne Animal,' Cuvier places *Lophiodon* between *Palæotherium* and the *Tapirs*.

LOPHORI'NA. [Bird of Paradise, vol. iv., p. 421.]

LOPHO'PHORUS. [Phasianidæ.]

LO'PHOTES, a genus of *Falconidæ* established by M. Lesson; but that term having been previously employed,[†] Mr. Gould and others adopt the generic title, *Lepidogenys*, proposed by Mr. J. E. Gray. Mr. Gould describes a species among his Australian Birds under the name of *Lepidogenys cristatus*. The form is somewhat allied to *Pernis*. Mr. Gould characterized at the same time several new species of *Falconidæ* from New South Wales, and the following new genus from the same locality.

Ieracidea.—Type, *Falco Berigora*. Vig. and Horsf. (*Zool. Proc.*, 1837.)

LOPHOTUS, a name applied by G. Fischer to a genus of *Simiadæ*

LOPHU'RA, a genus of Saurians established by Mr. Gray, but changed by Cuvier for *Istiurus*, because in his opinion the term *Lophura* comes too near to the term *Lophyrus*. The terms are however both in their construction and accentuation sufficiently distinct. [Iguanidæ, vol. xii., p. 439.]

LOPHY'ROPA. [Branchiopoda, vol. v., p. 339.]

LO'PHYRUS. [Columbidæ, vol. vii., p. 377.] The term is also employed by Duméril to designate a genus of *Saurians* (*Agama gigantea*, Kuhl.), and by Latreille as a name for a genus of *Hymenopterous Insects*.

LORANTHA'CEÆ, a natural order of Exogens, referred by most systematical writers to either the polypetalous or monopetalous subclass, but by others regarded as more closely in alliance with the apetalous Santalaceæ and Proteaceæ. They are in nearly all cases true parasites, growing upon the branches of trees, below whose bark they insert their roots, incorporating them with the wood, and feeding upon the vital juices of the plants which they attack. The principal marks of distinction in the structure of Loranthaceæ are a one-celled inferior fruit containing a single erect ovule, a fruit consisting of a peculiar viscid matter resembling birdlime, and a valvate corolla with the stamens opposite the petals. There is but one species, the common mistletoe, Viscum album, found wild in England; a species of Loranthus occurs in the south of Europe; but in the hot dry parts of tropical countries the species abound, swarming over the branches of trees, of which they often form a conspicuous feature, with their long clustered gaily coloured flowers. As in this country the mistletoe does not injure in any considerable degree the plant which it attacks, unless it exists in unusual quantity, so in India, where Loranthi are common, the injury sustained by vegetation is according to the reciprocal size of the parasite and its stock. Mr. Griffith states that a species called Loranthus Scurrula, which is generally attached to Melastoma malabathrica, or other shrubs, frequently destroys them to a considerable extent; others which are minute in comparison with the stock, especially such as grow upon trees, produce no appreciable injury. Although the nature of the pericarp of plants seldom forms a part of their ordinal distinctions, yet it is here employed—for this reason, that the viscidity of the fruit and the parasitical habits of the order are dependent on each other. The seeds sticking by their own glue to the branches on which they fall ensure to the young parasite, when it begins to grow, a suitable substance in which to push its roots; and as the viscidity of the fruit causes the greater part of it to catch upon branches before it falls to the ground, the young plant would die immediately after germination, if it were not a parasite, and thus the race would become extinct.

Mr. Griffith has shown (*Linn. Trans.*, xviii. 71) that in Loranthus and Viscum the ovules are not formed till after impregnation has taken place, a most curious and before unheard-of fact.

LORCA, a town of Spain in the province of Murcia, in the diocese of Carthagena, is built on the north slope of the Sierra de Caño, 40 miles west of Carthagena. It has an old castle, a collegiate church, besides other churches and convents, a royal college, an episcopal palace, two hospitals, several 'alamedas,' or public walks, planted with fine trees, and, according to Miñano, 40,000 inhabitants. It has manufactories of saltpetre, woollen and linen cloths, thread, and lace. The territory of Lorca is very fertile, especially in corn, but part of it suffers from drought. Various means have been tried to supply the deficiency of water, but they have failed through bad management and the political convulsions of the country. (Miñano, *Diccionario Geografico de España*.)

LORD ADVOCATE OF SCOTLAND. This is the peculiar appellation of the attorney-general, or senior standing counsel for the crown, learned in the law, in Scotland. The regular series of such officers cannot be carried to an earlier date than the end of the fifteenth century. Previous to that time, indictments before the lord-justiciar of Scotland seem to have been under the charge and superintendance of the clerk of court, or justice clerk, as he was termed [Justice Clerk]; and for prosecutions before the high court of parliament, we find sometimes the chancellor, sometimes the clerk register, and at other times a special counsel for the crown appointed.

The earliest standing 'Advocate,' and with whom the series properly begins, was Sir John de Ross of Mountgreenan, in the county of Ayr, an individual well known both in the politics and literature of his time: he is one of the Scottish poets commemorated by Dunbar. On the fall of Henryson and Lawson on the fatal field of Flodden, Wishart of Pittarrow was made both king's advocate and justice-clerk; but afterwards those offices were again separated, and when the Court of Session was erected in the beginning of the sixteenth century, Sir Adam Otterburn of Auldhame was king's advocate. On that occasion he was not only privileged to plead within the bar, but actually nominated one of the judges of the court, or a lord of session, as the king's treasurer and justice-clerk likewise were. It was from this circumstance he acquired the style of Lord Advocate, an appellation which occurs in the years 1573 and 1576 (Pitcairn's *Criminal Trials*), and was the fixed designation in 1587. (See the statute, 1587, c. 115.) This was in the time of David M'Gill of Rankielor; and before M'Gill had long left the office, it had the additional style of 'Right Honourable.' (See Act of Sederunt, 17th Nov.,

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[*] Kalkstein im Orenburger Gouvt. Dr Hermann Von Meyer places a note of interrogation after 'Tertiär.'

[†] By Giorna to designate a genus of Acanthopterygious fishes.

1610.) It was however in the time of Sir Thomas Hope (founder of the noble family of Hopetoun, and others) that the office acquired the vast political importance which has in modern times belonged to it. This arose not less from the subtle and ambitious character of that famous person, than from the circumstance of the king's removal to the throne of England, and the consequent remoteness of Scotland from the immediate seat of government.

In M'Gill's time the yearly salary attached to the office was 40*l*. When Hope was appointed in 1628, he had 200*l*. a year; and in the end of last century it was 1500*l*.

It is difficult to define the powers and duties of the lord advocate; they are said to be indefinable. The most prominent however is that of public prosecutor; and in this capacity he has, besides the solicitor-general, four standing deputies of his own appointment, who retire with him on a change of ministry. These deputies assist him in the Court of Justiciary, and are despatched by him to the several circuits of that court to prosecute indictments there. He has also a deputy in the Court of Exchequer; and a deputy or occasional substitute to conduct prosecutions before the sheriff of Edinburgh, or other county court. Every county court has indeed a 'procurator fiscal,' whose duty it is to sue on behalf of the crown in his county; but that officer is not yet placed on a proper footing, being neither of the bar, nor named by the crown or the lord advocate.

LORD-KEEPER (Custos magni Sigilli), an antient officer of the crown, who had the custody of the king's great seal, with authority to affix it to public documents, some of the most important of which have no force till they have been authenticated in this formal manner.

Until the reign of Henry III. the office of keeper of the great seal appears to have been distinct from that of chancellor, and generally subordinate to it. The chancellor, as a high judicial officer, was sworn at his entrance upon his duties, but the functions of the keeper being considered as chiefly ministerial, no oath appears to have been required from him. The chancellor was often elected by the baronage parliament, or great council of the nation, but the custody of the great seal was under the control of the king. The antient entries respecting the appointment of the chancellor generally are—A. B. Cancellarius (or in Cancellarium) Angliæ electus, or a baronagio, or in pleno parliamento, or per regem et parliamentum, constitutus est. Records of the reign of Henry I. and John show that both offices were held simultaneously by different persons under those princes. Sometimes the offices were united in one individual, who was thus both judge and minister. In the 11th year of Henry III., Ralph Nevill was appointed by parliament chancellor for life; and two years afterwards he received the custody of the great seal from the king. In 22 Henry III. the great seal was forcibly taken from Nevill by the king, who delivered it to two persons, Geoffrey the Templar and John Lexington; but as Nevill could not be deprived of his judicial authority by the crown, he continued to hold the office of chancellor until his death. But the great seal was under the control of the chancellor; and when Henry III. demanded it from the bishop of Chester, his chancellor, he answered, that having received the seal by the common council of the realm, he could not resign it to any one without the like common consent. It was matter of complaint against Henry III. that in 1261 he appointed Walter de Merton to be chancellor, 'inconsulto baronagio,' or without the consent of the baronage. In the following year he appears to have removed Hugh le Despencer the chief-justice, and Nicholas de Ely the chancellor, appointed by the barons.

Edward I. took the great seal with him into Flanders, and afterwards into Gascony, leaving his chancellor in England with a temporary seal: and in 6 Edward I. the bishop of Bath and Wells, the chancellor, on going abroad left the great seal in the custody of Sir John de Kirby, with an injunction to despatch the business of the chancelly in his absence. The chancellor cannot now make a deputy, or, as he was formerly called, a lieutenant. In 16 Edw. I., Ayremin, master of the rolls, and his companions, were keepers of the great seal; Burnell, bishop of Bath and Wells, being at the same time chancellor. Among the restrictions imposed on Edward II., in the fifth year of his reign, by the ordeinours elected by the barons and commons in parliament, it was provided that the king should *appoint* the chancellor and certain other great officers by *the advice and assent of his* baronage, and in parliament. This seems to have been the last interference with the royal authority over the appointment of chancellor until the time of the Long Parliament. In the more vigorous reign of Edward III. we find by the parliament roll that in 1343 the commons prayed that no alien might be made chancellor, but the king answered, that he could appoint whom he would. In 3 Richard II. the Commons prayed that the chancellor, treasurer, keeper of the great seal, chief chamberlain, and steward of the king's household might be appointed in that parliament. Henry V. had two great seals, one of gold, which he delivered to the bishop of Durham, making him *lord chancellor* of England, and another of silver, which he delivered to the bishop of London to *keep*. The statute of 31 Henry VIII., c. 10, assigned the same rank to the lord chancellor and the lord-keeper, giving to the person holding the one office or the other precedence over all lay peers except those of the blood royal; and in 5 Elizabeth, Sir Nicolas Bacon, lord-keeper, procured an act to be passed (c. 18), which, after reciting that some question had *of late* arisen whether like place, authority, pre-eminence, jurisdiction, and power belonged to the office of lord-keeper of the great seal of England, as belonged to the office of lord-chancellor of England, declares that the keeper of the great seal has always had, used, and executed the same place, authority, pre-eminence, jurisdiction, execution of laws, and all other customs, commodities, and advantages as the lord-chancellor.

Notwithstanding these two statutes the appointment of lord-keeper appears not to have stood so high in the estimation of the public as that of chancellor; and the great seal has been generally delivered with the latter title.

Upon the rupture between Charles I. and his parliament the king took the great seal to Oxford, upon which a new seal was ordered to be made by the parliament. This measure was the subject of severe reproaches from the royal ists; though unless the parliament were prepared to submit unconditionally to the king, it is difficult to say how any other course could have been adopted.

(Matth. Paris; *Parliament Rolls;* Coke's 4th *Inst.;* Bohun's *Cursus Cancell.*)

The power and duties of the lord-keeper, as identified with the chancellor, have already been stated. [CHANCELLOR; CHANCERY.]

LORD-LIEUTENANT. It was formerly usual for the crown, from time to time, to issue commissions of array, requiring certain experienced persons to muster and array the inhabitants of the counties to which such commissioners were sent. They were directed to put into military order those who were capable of performing military service, and to distrain such as were not qualified to serve, but were possessed of real or personal property, to furnish armour to their more vigorous countrymen; and they were to erect beacons where necessary. The form of these commissions, after much complaint, was settled by statute, and may be seen at length in the Parliament-rolls of 5 Hen. IV., 1403-4, vol. iii., p. 527.

In the 16th century these commissions of array appear to have generally given place to commissions of lieutenancy, by which nearly the same powers as those of the old commissions of array were conferred on certain persons as standing representatives of the crown for keeping the counties for which they were appointed in military order. In 1545 a commission 'de arraiatione et capitaneo generali contra Francos' issued to the duke of Norfolk, constituting him the king's *lieutenant*, and captain-general of all captains, vice-captains, men-at-arms, armed men, archers, and all others retained or to be retained against the French, in the counties of Essex, Suffolk, Norfolk, Hertford, Cambridge, Huntingdon, Lincoln, Rutland, Warwick, Northampton, Leicester, and Bedford. A similar commission issued to the duke of Suffolk for the counties of Kent, Sussex, Surrey, Hants, Wilts, Berks, Oxford, Middlesex, Bucks, Worcester, and Hereford, and London; and to John Russell, knight, Lord Russell, keeper of the privy seal, for the counties of Dorset, Somerset, Devon, Cornwall, and Gloucester. (Rymer.)

These officers are however spoken of by Camden, in the reign of Elizabeth, as extraordinary magistrates, constituted only in times of difficulty and danger, which was the case with commissioners of array, as appears from the recitals in their commission.

The right of the crown to issue commissions of lieutenancy was denied by the Long Parliament, and this question formed the proximate cause of the rupture between Charles I. and his subjects. Upon the Restoration the right of the crown to issue such commissions was established by a declaratory act, 14 Charles II., cap. 3.

The authorities and duties of the lord-lieutenant and of his temporary vice-lieutenants, and of his permanent deputy-lieutenants, have latterly been fixed and regulated by the militia acts. [MILITIA.]

LORD OF MISRULE, the master of the revels at Christmas in any nobleman's or other great house. 'First in the feast of Christmas,' says Stowe (*Surv. of Lond.*, edit. 1603, p. 98), 'there was in the king's house, wheresoever he was lodged, a Lord of Misrule, or master of merry disports, and the like had ye in the house of every nobleman of honor or good worship, were he spiritual or temporal: amongst the which the mayor of London, and either of the sheriffs, had their several Lords of Misrule, ever contending, without quarrel or offence, who should make the rarest pastimes to delight the beholders. These lords, beginning their rule on Alhallow-eve, continued the same till the morrow after the Feast of the Purification, commonly called Candlemas-day: in all which space there were fine and subtle disguisings, masks, and mummeries, with playing at cards for counters, nailes, and points in every house, more for pastimes than for gain.'

This Lord of Misrule, or revel-master, was sometimes termed a Christmas prince. Warton, in his 'History of English Poetry,' tells us that in an original draught of the statutes of Trinity College at Cambridge, founded in 1546, one of the chapters is entitled, 'De præfecto Ludorum, qui *Imperator* dicitur,' under whose direction and authority Latin comedies and tragedies are to be exhibited in the hall at Christmas; as also 'sex spectacula,' or as many dialogues. With regard to the peculiar business and office of Imperator, it is ordered that one of the Masters of Arts shall be placed over the juniors every Christmas, for the regulation of their games and diversions at that season of festivity. His sovereignty was to last during the twelve days of Christmas, and he was to exercise the same power on Candlemas-day. His fee was forty shillings. In an audit-book of Trinity College in Oxford, for the year 1559, Mr. Warton found a disbursement 'pro prandio *Principis Natalicii*.' A Christmas Prince or Lord of Misrule, he adds, corresponding to the Imperator at Cambridge, was a common temporary magistrate in the colleges at Oxford.

In Scotland, where the Reformation took a more severe and gloomy turn than in England, the 'Abbot of Unreason,' as he was there called, and other festive characters, were suppressed by the legislature as early as 1555. At Rodez, the capital of the province of Rovergne in France, previous to the Revolution, they had an 'Abbé de la Malgouverné,' who corresponded exactly with our Lord of Misrule.

After 1640 we hear nothing of the Lord of Misrule in England.

(Warton's *Hist. Engl. Poetry*, vol. ii., p. 378; Brand's *Popular Antiq.*, vol. i., p. 387-393; Nares's *Glossary*.)

LORDS, HOUSE OF,—one of the two assemblies which form together the Parliament of the United Kingdom. [PARLIAMENT.] The other is the House of Commons, which consists of persons who are elected from time to time to represent the people at large. [COMMONS, HOUSE OF.]

The persons who sit in the House of Lords are of two classes: 1, Lords Spiritual; 2, Lords Temporal.

The Lords Spiritual are the two archbishops and twenty-four bishops of the English Church, and one archbishop and three bishops of the Irish prelacy. Before the reformation of religion, when the monastic establishments which abounded in England were suppressed, the superiors of many of them, under the names of abbots and priors, sat as Lords Spiritual in this assembly. In those times the Lords Spiritual equalled, if they did not outnumber, the Lords Temporal who sat at any given time in Parliament; though now they form but about one-thirteenth of the persons composing this assembly. Six more bishops were added when the abbots and priors were removed.

The Lords Temporal are all the peers of England, being of full age, and not incapacitated by mental imbecility; sixteen representative peers of the Scottish peerage, and twenty-eight representatives of the Irish peerage. The number of the two last-named portions is fixed; but the number of peers of England sitting in the house is perpetually varying, and depends upon the casualties of minorities, and on the will of the king, who has an unrestricted power of increasing the number of peers.

The Scottish representative peers were introduced at the Union in 1707; and the Irish representative peers at the Union with that country in 1800.

The component parts of this assembly admit of being represented thus:—1. Persons sitting there in respect of offices held by them. Such are the spiritual lords of England. 2. Persons who sit in right of inheritance of a dignity of peerage. 3. Persons who have been created peers. 4. Hereditary peers of Scotland (for there can be no creation of peers of that part of the United Kingdom) elected by the whole body of the Scottish peerage to represent them in parliament, at the beginning of every parliament. 5. Hereditary or created peers of Ireland, elected by the whole body of the Irish peerage, and sitting for life, vacancies being supplied as they occur. And 6. Spiritual lords of Ireland, who sit in turns according to a cycle established at the Union. The great body of the house however consists of hereditary Lords Temporal of England, under the several denominations of dukes, marquisses, earls, viscounts, and barons. Each of the individuals of these ranks has an equal vote with the rest; but they are seated in the house in classes, and according to their precedency.

The only material changes which have been made in the constitution of this assembly in the long period of its existence have been: 1. The supposed limitation of the right of all holding lands in chief of the crown to sit therein, by King Henry III. after the battle of Evesham. 2. The removal from it of representatives of the counties, cities, and boroughs, who are supposed to have formerly sat with the lords, and the placing them in a distinct assembly, called the House of Commons. 3. The reduction in the number of the Lords Spiritual, by the suppression of the monastic establishments. 4. The introduction of the Scottish representative peers. And 5. The introduction of the Irish bishops and the Irish representative peers.

This house may be traced to the very beginning of anything like an English constitution. It is in fact the *magnum concilium* of the early chronicles. The bishops are sometimes said to sit there in virtue of baronies annexed to their respective offices; but it is questionable whether baronies are attached to the bishoprics of the new creation by Henry VIII.: and at best it is but a legal fiction, it being evident from the whole course of history that the bishops formed, as such, a constituent part of such assemblies in the Saxon times, and were, as such, among the chief advisers of the sovereign. One of the last acts of king Charles I., before he finally left London and disconnected himself from the Parliament, was to give the royal assent to a bill for removing the bishops from Parliament.

A question has been raised whether as the Lords Spiritual and the Lords Temporal, though sitting together, form two distinct *estates* of the realm, the concurrence of both is not requisite in any determination of this house, just as the consent of the two houses of Parliament is necessary to every determination of Parliament. But it is now understood that the Lords Spiritual and Lords Temporal are but one body, whose joint will is to be collected by the gross majority of voices; and statutes have been made in the absence of all the Spiritual Lords.

The House of Lords has two distinct functions: the legislative and the judicial.

In its legislative character, every new law, and every change in the existing law, must have the consent of a majority of this house, as well as of a majority of the House of Commons.

In its judicial character, it is a court for the trial: 1. Of criminal cases on impeachment by the House of Commons; 2. Of peers on indictments found by a grand jury; 3. For the hearing and determining of appeals from decisions of the Court of Chancery; 4. For the hearing and determining of appeals on writs of error to reverse judgments in the Court of King's Bench; and 5. In hearing and determining appeals from the supreme courts in Ireland and Scotland. The house has the power to require the attendance of the judges to assist it in the discharge of its duties.

A few points in which the House of Lords differs from the lower house of Parliament remain to be noticed. In the chair of the house sits the lord high chancellor of England. When the king (or queen) goes to Parliament he takes the throne in the House of Lords, and the Commons are summoned to attend him there to receive the communication

[illegible]

[illegible] the name of Loreto is derived. Further particulars concerning this tradition are given in the *Teatro Istorico della Santa Casa Lauretana della B. Vergine Maria e sua ammirabile traslazione in Loreto*, by Martorelli, bishop of Montefeltro, 2 vols. folio, Rome 1732, dedicated to Pope Clement XII. This legend has furnished Tasso with the subject of one of his finest lyrics, beginning with '*Ecco fra le tempeste e i fieri venti*.' A splendid church was afterwards built round 'the holy house,' and embellished and enriched by successive popes, among others by Leo X., Clement VII., and Sixtus V. The town of Loreto, which is small but well built, and contains 6000 inhabitants, has grown round the sanctuary, which is annually visited by numerous pilgrims. A considerable trade is carried on in beads, rosaries, agni Dei, and other devotional ornaments. Loreto is a bishop's see. The once well-filled treasury of the church of Loreto was in great measure emptied by Pius VI. to enable him to satisfy the demands of the French in 1796. In the following year, when the French took Loreto, they found little to glean. The church and treasury have been again enriched since the Restoration by votive offerings of devotees. (Valéry, *Voyages en Italie*.)

LORENZO DE' MEDICI. [MEDICI.]

LORICA'RIA. [CELLARIEA, vol. vi., p. 405.] The term *Loricaria* is also employed by Linnæus to designate a genus of *Malacopterygious Fishes*.

LORICA'RIA, a subdivision of the Linnæan genus Cellaria, proposed by Lamouroux. [CELLARIEA.]

LORICA'TA, the name applied by Merrem and Fitzinger to the *Crocodiles*, *Emydosaurians* of De Blainville. [CROCODILES, vol. viii., p. [illegible]]

LORIENT, a town and port of France, at the confluence of the Scorf and the Blavet, in the department of Morbihan, [illegible] miles west by south of Paris in a direct line, or [illegible] miles by the road through Alençon, Fougères, Rennes, and Ploërmel.

This town is of modern origin. In A.D. 1666 Louis XIV. granted permission to the French India Company to establish magazines and docks for building vessels on a part of the shore of Port Louis, the name given to the mouth of the Blavet. The establishment thus formed, which continued long in the possession of the company (now dissolved), is at present in the hands of government. From the company's establishment the place took the title of L'Orient (East or the East). In A.D. [illegible] the building of the town was commenced; in 17[illegible] the inhabitants [illegible]; [illegible] the town was incorporated. The India Company had previously established here [illegible] commodities. In 1744 [illegible] of the Revolution [illegible] declined; [illegible] has been gradually [illegible]

[illegible] well-paved, [illegible] and there are [illegible] over the Scorf, [illegible] meat and fish [illegible] entitled to notice. [illegible] The port is [illegible] walled off: its [illegible] nearly [illegible] feet. [illegible] kingdom; [illegible] down fifteen [illegible] carrying [illegible]. Among [illegible] the dockyard [illegible] for ships [illegible] by steam; [illegible] of whom [illegible] barracks, [illegible] school of naval [illegible] drawing-hall; [illegible] prefect; and [illegible] public service. There is a watch-tower, from which vessels can be discerned [illegible] at sea.

The population of the commune of Lorient, at the beginning of the present century, was above [illegible]; in 18[illegible] it had sunk to little more than [illegible]. In 1831 it was [illegible] (of whom [illegible] were in the town); in 1836 it was [illegible]. There are some manufactures of hats, linens, bread, and pottery: the trade consists in the export, partly to the colonies, of wax, honey, salt, butter, corn, cattle, and manufactured goods. The sardine fishery is actively carried on. There are three yearly fairs.

About a mile from the arsenal, on the bank of the Scorf, is a powder-magazine; and a mile west, an exercise-ground for the artillery. An hospital has lately been erected on the Island of St. Michel, in the roadstead.

There are in Lorient a subordinate court of justice, custom-house, and stamp and other government-offices; a high school; an establishment for the special instruction of students destined for the navy, or for the great schools of Forestière and St. Cyr and the Polytechnic School; an agricultural society; a society for affording gratuitous instruction in practical geometry and mechanics; a free-school for arithmetic and geometry; a free-school on the monitorial system: and six elementary schools. There are also a well-arranged and well-ventilated prison, and a civil and military hospital, besides that on the Island of St. Michel. The fortifications of this town are in tolerable condition. The environs are exceedingly well cultivated.

Lorient is the capital of an arrondissement, containing an area of 772 square miles: it is subdivided into eleven cantons, or districts, each under a justice of the peace, and 48 communes: the arrondissement had a population, in 1831, of 128,458; in 1836, of 133,307.

LO'RIPES. [VENERIDÆ.]

LORIS. [LEMURIDÆ; NYCTICEBUS; STENOPS.]

LORN is a district of Argyleshire, bounded on the east and north-east by Loch Linnhe and the Atlantic Ocean; on the south and south-west by Lochs Melfort, Aich, and Awe, and by the district of Argyle; on the west by Perthshire, and on the north by the shire of Inverness, from which it is separated by Loch Leven. It is divided into Upper or Northern Lorn, Nether or Southern Lorn, and Mid Lorn, and lies between 56° 18′ and 56° 42′ N. lat., and between 4° 35′ and 5° 37′ W. long., comprising the 13 parishes of Appin, Andchattan, Dalavich, Glenorchy, Kilbrandon, Kilbride, Kilchattan, Kilchrenen, Kilmelford, Kilmore, Kilninver, Lismore (island), and Muckairn. The above boundary, which differs considerably from that given by several topographers (some of whom make Loch Etive one of the boundaries), is taken from Langland's large map of Argyleshire, published in 1801. The parishes comprised in the district are those enumerated in the Population Returns.

LORRAINE, a province or military government of France before the Revolution, situated on the north-eastern frontier. It was bounded on the north by the duchy of Luxembourg and the electorate of Trèves; on the north-east by the duchy of Deux Ponts in the Palatinate; on the east by Alsace, from which it was separated by the Vosges; on the south by Franche Comté; on the south-west by the county of Langres in Champagne; and on the west by other districts of Champagne. The length of the province was about 115 miles from north to south; its breadth from east to west 130 miles in the northern and about 70 miles in the southern part. It area was about 6730 square miles. It was watered in the west by some of the feeders of the Aisne and Marne, belonging to the system of the Seine, and by the Meuse; on the east by the Moselle and its tributaries.

Lorraine, in the extended application of the name, corresponding with the bounds and dimensions given above, comprehended the following divisions:—

Larger Divisions.	Subdivisions.	Chief Towns, with population in 1836.
I. The Duchy of Lorraine, containing	1. La Lorraine Propre .	NANCI, 31,445; Lunéville, 12,798.
	2. La Lorraine Allemande, or German Lorraine . . .	Sarreguemines. 4113.
	3. Le Pays des Vosges .	Epinal, 9526; Mirecourt, 5684; Remiremont, 5055; St. Diey, 7906.
II. The Duchy of Bar, or Le Barrois, containing	1. Le Barrois Mouvant	BAR sur Ornain, or Bar le Duc, 12,496 in 1831.
	2. Le Barrois non Mouvant	Briey, 1730.
III. The three Bishoprics, containing	1. Le Pays Messin .	METZ, 42,793.
	2. Le Toulois . . .	TOUL, 7333.
	3. Le Verdunois . .	VERDUN, 10 577.

A small portion of La Lorraine Allemande was ceded by France to Prussia by the treaty of Vienna, 1815, and has been incorporated in the Rhenish Provinces of that kingdom. The remainder constitutes the departments of MEURTHE, MEUSE, MOSELLE, and VOSGES.

At the time of the Roman Conquest of Gaul under Cæsar, Lorraine was inhabited by the Treveri, or Treviri, the Mediomatrici, the Verodunenses, and the Leuci, all Belgic tribes, whose country, in the subdivision of the Roman province, or, as it was termed in the later period of the Empire, the diocese of Gaul, formed the province of Belgica Prima. This part of Gaul was comprehended in the earlier conquests of Clovis, to whom all France north of the Loire and the Rhône became subject by the close of the fifth century.

In the division of the Frankish empire under the sons of Clovis, Lorraine formed part of the kingdom of Austrasia. In this kingdom the power of the Franks was greater and the military habits of the people were more firmly retained than in other parts of France. It was in this part of France that the Carlovingian family first rose to power under Pepin l'Heristal and Charles Martel.

In the division of the empire of Charlemagne between the children of his son and successor Louis le Debonnaire, that part of France which lies east of the Meuse, the Saône, and the Rhône, became, with other countries as far as the Rhine, and with Italy and Switzerland, the portion of the emperor Lothaire (A.D. 843). In the partition of this prince's dominions, the northern part, comprising the country between the Rhine and the Meuse, was assigned to his son Lothaire the younger. From one or both of these princes the country took the name of the France of Lothaire, in Low Latin Lotharingia, whence the German name Lothringen, and the French Lothierregne and Lorraine. This kingdom existed for a long period, and was united with the imperial crown, so that eastern France became a portion of the empire.

The duchy of Lorraine consisted of a large part of the kingdom of Lorraine. It was established in the tenth century, and was afterwards divided into two parts, Lower Lorraine or Brabant, and Upper Lorraine, which has retained its designation to modern times. The duchy of Upper Lorraine was in the eleventh century conferred by the emperor on Gérard, a noble of Alsace. From this Gérard descended the long line of the dukes of Lorraine who governed the country till towards the middle of the last century. The reigns of Gérard's successors were chiefly occupied with civil dissensions, in which they were engaged with their subject nobility and ecclesiastics. Simon II., who was duke from A.D. 1176 to A.D. 1205, distinguished himself by the repression of internal disorders, and by the protection of the churches and of the poor from the aggressions of the rich. He expelled the Jews from his dominions. He abdicated his duchy to retire to a cloister, where he died shortly after, A.D. 1207. The county, afterwards duchy of Bar, was separated from the duchy of Lorraine in the eleventh century. In the following centuries the dukes were continually engaged in hostilities, either as vassals of the emperors of Germany (who were possessors of the antient kingdom of Lorraine), or on their own account with other potentates, or with the more powerful of their own vassals, especially the bishops of Metz. The connexion of the dukes with France, under the crown of which they held some fiefs, involved them also in the disputes, foreign and domestic, of that kingdom. Raoul, duke of Lorraine, was one of those who fell in the battle of Creci, A.D. 1346, fighting with Philippe of Valois against the English; and Jéan, his son and successor, a mere boy, was taken prisoner after distinguishing himself by his valour at the battle of Poitiers, A.D. 1346. He was again taken prisoner, A.D. 1364, at the battle of Auray in Bretagne, in which Charles de Blois was defeated and slain by Jéan de Montfort, his rival claimant for that duchy. [BRETAGNE.] The duke Jéan of Lorraine was also present at the battle of Rosbecque, in which Charles VI. of France defeated the Flemings (A.D. 1382): he died A.D. 1390.

On the death of Charles le Hardi, the successor of Jéan in the duchy of Lorraine, the succession was disputed by René I., duke of Bar and of Anjou, and Antoine de Vaudemont, nephew of Charles. In the war that ensued René was defeated and taken prisoner (A.D. 1431) by his rival, who was supported by the duke of Bourgogne, while René had the assistance of Charles VII. of France. René ultimately obtained his liberty (A.D. 1436), and set out for Naples, the crown of which had fallen to him during his captivity. Lorraine had been confirmed to him by the decision both of the emperor Sigismund and of the council of Bâle. The life of René was busy. In A.D. 1453, long before his death, he resigned the duchy of Lorraine to his eldest son Jéan, duke of Calabria, who joined in the 'Ligue du Bien Public' against Louis XI. of France (A.D. 1464), and died (A.D. 1470) at Barcelona in an attempt to vindicate his claim to the crown of Aragon. He was succeeded by his son Nicholas, on whose death (A.D. 1473) Lorraine came to René II., grandson, on his mother's side, of René I., and on his father's side, of Antoine, duke of Bar, who had been René's competitor. René II. was seized by Charles le Téméraire, duke of Bourgogne [BOURGOGNE], together with his mother Yolande, almost immediately on his (René's) accession to the duchy, and though released by the interference of Louis XI., was obliged to make an alliance, offensive and defensive, with Charles. Charles soon afterwards again attacked Lorraine, took the capital (Nanci) and other towns, and obtained possession of the whole duchy. The defeat of Charles by the Swiss at Granson (March, 1476) revived the hopes of René. He assisted the Swiss with a body of troops in their second victory over Charles at Morat, in June in the same year; and returning to Lorraine, rapidly reconquered it. Nanci surrendered to him in October; and upon Charles leading an army in the ensuing winter, to recapture the town, he was defeated and slain by René (January, 1477). René subsequently distinguished himself in the wars of Italy; and obtained of Charles VIII. of France the restoration of the duchy of Bar, which had been seized by Louis XI. René died A.D. 1508.

Antoine, the successor of René II. (A.D. 1508), seems to have merited, by his care to promote the happiness of his subjects, the title which he received of '*the Good*.' His reign is chiefly remarkable for his struggle against the peasants of Alsace, whom the excitement of the Reformation induced to rise in vindication of their liberty, but who failed in their attempt; and for the declaration of Lorraine as a free and independent sovereignty by the Germanic body. In the wars of the emperor Charles V. with François I. of France, Antoine preserved a wise neutrality. He died A.D. 1544, and was succeeded by his son François I. The duchy of Lorraine, which thus took rank among the sovereign states of Europe, was not co-extensive with the French province of Lorraine, of which it subsequently constituted only a subdivision, as noticed in the preceding geographical sketch.

François I. reigned only a year. He was succeeded by his son Charles II. (or III.), who during the long period in which he held the duchy (A.D. 1545-1608) did much for its improvement: he acquired regal rights over that part of the duchy of Bar which he held as vassal of the king of France, reserving only the homage due to the latter and the right of appeal. Duke Charles founded a university at Pont à Mousson. He supported the party of the League in France, at the head of which were his kinsmen the princes of the house of Guise. [GUISE.]

Henri II., François II., and Charles III. (or IV.) successively occupied the ducal throne. Charles III. (or IV.) was involved in hostilities with Louis XIII. of France, by whom the duchy was in great part conquered. Duke Charles distinguished himself in the thirty years' war in Germany, and was one of the commanders in the army of the Catholic League at the battle of Nordlingen, A.D. 1634. The treaty of the Pyrenees restored Lorraine to him; and subsequent negotiations (A.D. 1661) with cardinal Mazarin secured also the restitution of the duchy of Bar. The other districts which subsequently made up the province of Lorraine were then in the hands of the French king; and Charles agreed that on his death the whole of his states should fall to the crown of France. But the duke, suspicious of the designs or apprehensive of the power of France, renounced his independent sovereignty, and renewed his allegiance to the emperor. And when, in A.D. 1670, Louis XIV. seized his dominions, an imperial ambassador was sent to Paris to claim exemption from hostilities for them as part of the empire. After two or three years spent in negotiations, hostilities became general on the Continent, and Duke Charles distinguished himself in the imperial service on several occasions, till his death, A.D. 1675. His restless, unquiet, and versatile character had involved him in continual difficulties. He was succeeded by his nephew Charles IV. (or V.), also a distinguished military commander. Finding himself (A.D. 1677) at the head of an army of 60,000 imperialists, he attempted to regain possession of Lorraine, but was baffled by the skill of the French Maréchal Crequi, who had only 30,000 men. At the treaty of Nimeguen, A.D. 1678, the restitution of Lorraine was offered to him, but on conditions which he refused to accept. He distinguished himself afterwards at the head of the imperialists in Hungary against the Turks, and aided Sobieski in the deliverance of Vienna (A.D. 1683). He died A.D. 1690.

Leopold, the successor of Charles, obtained restitution of his states by the treaty of Ryswick, A.D. 1697. He observed neutrality in the war of the Spanish succession, and devoted himself to the improvement of his dominions. He died A.D. 1729, and was succeeded by his eldest son François Etienne, who in 1735 acquiesced in a treaty between France and the empire, by which his duchy was ceded to Stanislaus Leckzinski, ex-king of Poland, whose daughter had been married to Louis XV. of France. It was further agreed that on the death of Stanislaus the duchy should be united to France. François Etienne, who married, the following year, the archduchess Maria Theresa, and was afterwards (A.D. 1745) elected to the imperial crown, received the reversion of Tuscany in exchange for Lorraine. Stanislaus was recognised as duke of Lorraine and Bar, A.D. 1737. He governed the country with wisdom and beneficence, encouraged agriculture and trade, managed his finances with economy, and founded, for the cultivation of science, the Académie of Nanci, of which he became a member. His robe de chambre having accidentally taken fire, he was so severely burned that he died eighteen days after, on the 23rd February, 1766, aged eighty-nine. On his death Lorraine was incorporated with France, to which it has ever since remained attached.

LORRAINE, CARDINAL DE. [GUISE.]

LORY. [PSITTACIDÆ.]

LÖSS, a peculiar loamy deposit in the valley of the Rhine, and extending to some breadth beyond that area, which may be conjectured to be analogous with accumulations in valleys of South America containing the megatherium, and with other 'valley formations' in different parts of the world. It borders the valley plain of the Rhine, reaching, though not continuously, from Schaffhausen to Cologne, enters many of the lateral dales, lies against the hills, and constitutes hills itself. In the line between Basle and Bingen it occupies the left bank by Worms, Oppenheim, Flonheim, &c., and the right bank by the Schwarzwald to Basle. Compared to the usual character of diluvium, the Löss is a fine-grained deposit; fine sand, clay, and calcareous earth, easily pulverized, and containing some nodular concretions, constitute the mass of the deposit. It sometimes (at Heidelberg) alternates with gravel.

Principally in the upper parts of the Löss are found shells of land, fresh-water, and marsh mollusca now living in the vicinity. These sometimes retain their colour. Bones and teeth of quadrupeds usually met with in diluvium occur locally in Löss, as at Weinheim and Bensheim. These bones appear sometimes to have been drifted to their present repositories, as at Rixheim, where upon and in cavities in the fresh-water tertiaries bones of stag, rhinoceros, hyæna, elephant, horse, &c. occurred. Cannstadt yielded bones and teeth of elephant, rhinoceros, tiger, hyæna, wolf, bear, stag, roebuck, oxen, horses, boar, mouse, hare, birds, and remains of vegetables. (Meyer, *Palæologica.*)

Between Strasburg and Sulzbad the Löss reaches 600 French feet above the sea, and on the Kaiserstuhl 1200 feet, an elevation supposed to be explained by the volcanic character of the vicinity. The thickness of the Löss is stated to reach 200 or even 300 feet. Near Andernach, Löss alternates with volcanic sediments ('Trass'), but generally overlies them, and in places fills old craters (as the Roderberg, near Bonn).

The deposition of Löss in the upper Rheinthal has been often viewed as the effect of a lake supposed to have extended from Basle to Mayence, and to have been drained by the opening of the narrow gorge at Bingen; but from the continuation of this deposit below that gorge, the elevation it has attained on the flanks of the Siebengebirge, and other circumstances, Mr. Lyell, who has specially examined the subject, proposes a different hypothesis. He thinks that the whole country drained by the Rhine has undergone changes of level, such that after having formerly stood for some unknown period with nearly its actual height and physical features, it experienced a great and general depression, so as to receive river deposits in great abundance; and that it was again raised, so as to permit the partial re-excavation of the antient valleys, and the removal of much of the fluviatile sediments: what remains is the Löss.

(Meyer, *Palæologica;* Lyell, in *Edinb. Phil. Journal*, 1834; and *Principles of Geology*, last edition, vol. iv.)

LOSTWITHIEL. [CORNWALL.]

LOT, a river in France, belonging to the system of the Garonne. [FRANCE; GARONNE.] It rises on the north-western slope of the Cévennes, not far from Mount Lozère. Its general direction is west, past Mende, Espalion, Cahors, and Villeneuve d'Agen, into the Garonne, which it joins a few miles below Agen. Its length is about 220 miles; for 70 of which, viz. from Entraygues, a few miles below Espalion, it is navigable; but the navigation is difficult and dangerous, especially above Cahors, from the rocks which obstruct the current. Below Cahors the navigation is facilitated by several sluices.

The river is supposed to have been known to the Romans by the name of Oltis, which leads us to Olt as the old vernacular term, a name which also belongs to a small river of Lancashire and to a branch of the Danube. A town on the bank is still called St. Geniès de Rivedolt, or Rive d'Olt, and another is called St. Vincent de Rivedot (Rive d'Old). From the incorporation of the article (L'Olt), the modern name Lot has resulted.

LOT, a department of France traversed by the Lot, is bounded on the north by the department of Corrèze; on the north-east by that of Cantal; on the south-east by that of Aveyron; on the south by that of Tarn et Garonne; on the south-west by that of Lot et Garonne; and on the north-west by that of Dordogne. Its greatest length is from the neighbourhood of the town of Moncuq in the south-west to the bank of the Cère in the north-east, 68 miles; its greatest breadth, at right angles to the length, is from between the towns of Martel and L'Arche (Corrèze) to the neighbourhood of Figeac, 52 miles. The area is estimated at 2034 square miles, being about equal to that of the English county of Norfolk. The population in 1831 was 283,827; in 1836, 287,003, showing an increase in five years of 3176, or rather more than 1 per cent., and giving about 141 inhabitants to a square mile; considerably below the average density of population in France, and very far below that of the English county with which we have compared it. Cahors, the capital, is in 44° 26′ N. lat. and 1° 27′ E. long., 307 miles in a direct line south by west of Paris, or 370 miles by the road through Orléans, Châteauroux, and Limoges.

The department has no very lofty elevations; but hills of moderate height occupy a considerable part of its surface. The principal range is a branch from the central group of Auvergne: it enters the department on the eastern side, and extends through it westward into the adjacent department of Dordogne, separating the basin of the Dordogne from that of the Lot. The south-western part of the department, in the neighbourhood of Cahors, is occupied by the chalk formation; the southern and central parts by the strata which intervene between the chalk and the new red or saliferous sandstone; the eastern side by the formations from the saliferous sandstone (inclusive) to those which repose on the primitive rocks; and the north-eastern part of the department along the bank of the Cère by the primitive rocks. Among the mineral productions are coal and iron; but the whole quantity of coal produced in 1835 was only 60 tons: the iron-works are also unimportant. The hills afford granite, marble of various colours, alabaster, calcareous spar, and stone for millstones and lithography. Crucible-clay and fullers' earth are found in the valleys. There are several mineral springs. There are one or two remarkable caverns in the department; one near the bank of the Selle contains the fossil bones of animals not now found in Europe.

The northern side of the department is watered by the Dordogne, which first skirts the border for two or three miles, separating the department from that of Corrèze, and then flows through the department in a winding channel past the town of Souillac: after again skirting the border for two or three miles, it enters the department of Dordogne. The navigation commences at Mayronne. The southern part of the department is watered by the Lot, which, after dividing it for several miles from the department of Aveyron, crosses it in a very sinuous course from east to west into the department of Lot et Garonne. It is navigable throughout.

The navigation of the Dordogne in this department may be estimated at about fifteen miles; that of the Lot at about eighty-six. There are no canals.

The number of Routes Royales, or government roads, is only four: their aggregate length (Jan. 1, 1837) was 170 miles, of which 115 were in repair, 13 out of repair, and 42 unfinished. The principal roads are those from Paris by Orléans and Limoges to Cahors, and from Cahors to Montauban and Toulouse. These two roads form one line, which crosses the department from north to south. Other roads lead from Cahors eastward to Villefranche and Rodez (Aveyron), and westward along the banks of the Lot and the Garonne to Bordeaux (Gironde). The Routes Départementales were nineteen in number, with an aggregate length of nearly 400 miles, but not half of them were finished. The bye-roads and paths amount to between five and six thousand, with an aggregate of nearly 16,000 miles.

The soil of the department is chiefly calcareous, and nearly half of it is under the plough. More corn is raised than is required for home consumption; and fruit, hemp, tobacco, and saffron are grown. The vineyards occupy about a ninth part of the department: the export of wine is large, and the wines are in good repute, especially those of Cahors and Le Grand Constant. The white mulberry-tree is cultivated in almost all places, in order to the rearing of silkworms, which is much attended to. The woodlands are also extensive, occupying about one-sixth part of the department. The number of sheep reared is great, wool being an important object of attention to the farmer. Poultry, game, and truffles are abundant.

The department is divided into three arrondissements, as follows:—

Arrondissement.	Situation.	Area in Sq. Miles.	Population in 1831.	Population in 1836.	Communes.
Cahors,	S.	860	116,336	117,299	122
Figeac	N.E.	616	87,727	89,778	112
Gourdon	N.W.	558	79,764	79,926	66
		2034	283,827	287,003	300

There are twenty-nine cantons, or districts, each under a justice of the peace.

In the arrondissement of Cahors are Cahors (population in 1831, 10,818 town, 12,050 whole commune; in 1836, 12,417 commune) [Cahors]; St. Cirq, Vers, La Roque-des-Arcs, Luzech, St. Vincent-de-Rivedot, Castlefranc, Belleye, Prayssac, Crezels, Puy-l'Evêque, and Duravel, on or near the Lot; Cabreres or Cabrerets, on the Celle, a feeder of the Lot; Concots, Beauregard, Lalbenque, Castelnau-de-Montratier (pop. 4053), and Moncuq, in the country south of the Lot; and Catus, St. Médard, Lherin, or Lherm, Les Arques, Cazals, Marmignac, Montelera, and Fressinet, or Fraissinet, in that part of the arrondissement which lies north of that river. Cabreres or Cabrerets is remarkable for a grotto with beautiful stalactites. Castlenau-de-Montratier is on a hill, the base of which is washed by the Latte or Lute, one of the streams flowing into the Garonne. It has some manufactures of coarse woollens for the clothing of the peasantry of the neighbourhood. The church was, before the Revolution, a collegiate church.

In the arrondissement of Figeac are Figeac and Marcillac, on the Celle; Bouillac, Capdenac or Cadenac, and Cajare, on the Lot; Cardaillac and Fons, on two small streams which unite and flow into the Celle; Brétonoux on the Cère, a feeder of the Dordogne; St. Céré on the Bave, that flows into the Cère; and Loubressac, Sousceyrac, and L'Hôpital. Figeac, capital of the arrondissement, owes its origin to a wealthy Benedictine abbey, founded in A.D. 755 by king Pepin le Bref, and afterwards secularized. Figeac was besieged A.D. 1568 by a powerful army of Huguenots; but the assailants, after three months, were obliged to raise the siege. They afterwards took the town by surprise, A.D. 1576, pillaged it, and put many of the Catholics to the sword. They erected a citadel, which was given up in A.D. 1622 to Louis XIII., who demolished it, as well as the fortifications of the city. There are two fine Gothic churches at Figeac. The population in 1831 was 4691 for the town, or 6390 for the whole commune; in 1836 it was 6237 for the commune. Some cotton manufactures are carried on, and there is considerable trade in wine and cattle. Coal is obtained in the neighbourhood, and there is a quarry of excellent freestone. Marcillac had formerly an abbey, the foundation of which was ascribed to Pepin le Bref. There is near the town a remarkable grotto, comprehending several apartments, with stalactites and stalagmites having the forms of columns and statues. Near Cajare are some caverns, denominated 'the Caverns of Waiffre,' from the circumstance of the adherents of Waiffre, duke of Aquitaine, having sought safety in these caverns, where they were discovered and massacred by the soldiers of Pepin le Bref. St. Céré (pop. 2905 town, 3987 whole commune) had, before the Revolution, two religious houses. Hempen cloth is manufactured here, and considerable trade is carried on in raw hemp and hempen thread. Good marble is quarried near the town. At the village of Assier, not far from the Celle, are the remains of a fine castle, built in the time of François I. by Galiot de Genouillac, one of his officers. There is also a church, the architecture of which is remarkable for its lightness.

In the arrondissement of Gourdon are Gourdon and Le Vigan, on the Bloue or Bleu, a small stream which flows into the Ceou, a feeder of the Dordogne; Carennac and Souillac, on the Dordogne; Martel in the country north of that river; Gramat and Rocamadour, on the Alzou, which flows into the Dordogne; Montfaucon, on the Ceou, a feeder of the Dordogne; Degagnac and Lavercantière. Gourdon is on a rising ground: the population in 1831 was 2813 for the town, or 5153 for the whole commune. In 1836 it was 5334 for the commune. There are some manufactures of woollen stuffs and sail-cloth. Coarse-grained granite is quarried in the neighbourhood. Souillac (pop. 2253 town, 3096 whole commune) has a parish church, formerly belonging to an antient Benedictine abbey, and a fine bridge of seven arches over the Dordogne, which is here navigable. There is a royal manufactory of fire-arms; coarse woollens and hats are manufactured; and trade is carried on in wine, leather, salt, and timber. There are near the town two remarkable intermitting springs, called Le Gourg and Le Bouley. Limestone and building-stone are quarried near Martel (pop. 1824 town, 2903 whole commune) and Gramat (pop. 1545 town, 3428 whole commune). Rocamadour had formerly a monastery, the church of which still exists; it was an object of resort to pilgrims, on account of the burial there of St. Amadour, whom some legendary fables confounded with Zaccheus the publican, mentioned in the gospel of St. Luke. Henry II. of England made a pilgrimage to this place: his son Henry was on his way to pillage the church when he died. A sword chained to the walls of this church is affirmed to be that of the chivalrous Roland. There is another church or chapel at Rocamadour cut out in the rock.

The chief manufactures of the department are woollen stuffs of various kinds, linens, and some silks. The chief trade in agricultural produce is corn, flour, wine, and walnut oil and hemp. These goods are sent to Cahors to be sent down the Lot, or to Souillac for embarkation on the Dordogne.

The department constitutes the diocese of Cahors, the bishop of which is a suffragan of the archbishop of Albi. It is in the jurisdiction of the Cour Royale of Agen, in the circuit of the Académie Universitaire of Cahors, and in the eleventh military division, the head-quarters of which are at Bordeaux. It sends five members to the Chamber of Deputies. In respect of education this department is far below the average of France. Of the young men enrolled in the military census of 1828-29, only twenty-four in a hundred could read and write, the average of France being thirty-nine.

In the time of Cæsar this department was part of the territory of the Cadurci, from whom its capital Cahors, originally Divona, derived its name. Uxellodunum, the last place in Gaul which held out against Cæsar, was probably a hill called Puech d'Issolu, on the bank of the Tourmente, a small feeder of the Dordogne in this department. Another town, Varadetum, mentioned in the Peutinger Table, was probably at or near Varaie, a village south of the Lot. Before the Revolution the country included in this department constituted the greater part of Querci or Quercy, a province of Guienne.

LOT ET GARONNE, a department of France, bounded on the north by that of Dordogne; on the north-east by that of Lot; on the south-east by that of Tarn et Garonne; on the south by that of Gers; on the south-west by that of Landes; and on the west and north-west by that of Gironde. Its greatest length is from north-east, near the little town of Sauveterre, to south-west on the border of the department of Landes, between Castel Jaloux (Lot et Garonne) and Roquefort (Landes) 66 miles; the greatest breadth, at right angles to the length, is from near the little town of Duras north west to the neighbourhood of Puymirol south-east, 54 miles. The area is estimated at 2057 square miles, rather less than the average area of the French departments, but rather more than that of the English county of Norfolk. The population in 1831 was 346,885; in 1836 it was 346,400, showing a decrease in five years of 485, and giving 168 inhabitants to a square mile; rather more than the average density of population in France, but not equal to the density of the population of the English county with which we have compared it. Agen, the capital, is on the Garonne, in 44° 12′ N. lat., 0° 36′ E. long., about 330 miles in a direct line south by west of Paris, or 369 miles by the road through Orléans, Limoges, and Perigueux.

The department has no elevations deserving the name of mountains: the hills which divide the valley of the Dordogne from that of the Lot occupy a small portion on the north-east; and the range of high land which, branching from the Pyrenees, divides the basin of the Adour from that of the Garonne, overspreads a small portion on the south-west. The surface of the department is generally undulating, and slopes gently towards the west. The department is wholly occupied by the strata above the chalk. Some iron is procured; and there are marl-pits and gypsum-quarries. Peat and potters' earth are also procured; the first in small quantity, the second abundantly.

The principal rivers are the Garonne, and its tributaries the Lot and the Baise. The Garonne enters the department from that of Tarn et Garonne on the south-east side, and runs west-north-west 27 miles to a little above the junction of the Baise, receiving the Saône on its left and the Gers on the right bank: it then runs 15 miles north by west to below Tonneins, receiving the Baise on the left and the Lot on the right bank: from below Tonneins it flows about 20 miles north-west into the department of Gironde. The length of that part of the river which is in this department may be estimated at 62 miles: the official returns make it 65. The Baise enters the department from that of Gers on the south side; and flows 17 miles north by west by Nérac (where it becomes navigable) to Lavardec; from thence it flows north-east and north 7 miles into the Garonne: its whole course in the department is 24 miles, for about half of which it is navigable. The Lot enters this department from that of Lot, on the eastern side: and flows in a winding course south-west 12 miles to the little town of Penne, where it receives the Bondusson on the left bank; from thence it flows west by north 12 miles to Chasseneuil; and from Chasseneuil 20 miles south-west to its junction with the Lot: its whole course in this department is about 44 miles (the official returns give 51), for the whole of which it is navigable. The Dropt, a tributary of the Garonne, waters the northern part of the department, in which it is navigable for about 16 miles; it unites with the Garonne in the adjacent department of Gironde. The total inland navigation of this department amounts, according to the official returns, to about 150 miles. There are no canals.

There were in 1837 six government roads, with an aggregate length of 223 miles, of which 38 miles were unfinished. The road from Paris by Limoges and Perigueux enters the department on the north and runs southward by Castillonnes, Villeneuve d'Agen, Agen and Astafort to Auch, in the department of Gers. Roads branch off from this at Villeneuve d'Agen by Libos and Fumel, along the bank of the Lot to Cahors (Lot); and from Agen by La Plume and La Monjoye to Condom (Gers). A road from Bordeaux to Toulouse by the bank of the Garonne passes through Bazeille, Marmande, Tonneins, Clairac, Aiguillon (where a road from Villeneuve d'Agen by Temple and La Fate falls into it), Port-Sainte-Marie, Clermont, and Agen (where it intersects the great road from Paris to Auch), into the department of Tarn et Garonne. A branch from this road at Port-Sainte-Marie leads by Lavardec and Nérac along the banks of the Baise to Auch.

The departmental roads were sixteen in number, having an aggregate length of above 270 miles, of which about 55 miles were out of repair, and nearly 100 miles unfinished. The bye-roads and pathways amounted to above nine thousand, with an aggregate length of nearly 8000 miles.

The valleys watered by the Lot and the Garonne are among the richest portions of the soil of France: but the western side of the department is occupied by those dreary wastes, or 'landes,' which overspread so large a portion of this part of France [GIRONDE; LANDES]: they constitute about an eighth of the department. These districts, covered with dry and shifting sand, produce only a little rye or panic, and that by the aid of manure; they are covered in some places by pools and marshes; in other parts by forests of pines or cork-trees, which constitute an important part of the wealth of the department. The northern parts of the department are occupied by a ferruginous clay which yields but a poor return to the cultivator; and the hills between the Garonne and the Lot in the eastern part are little better. These comparatively unproductive soils extend over two-thirds of the department. The valleys of the Lot and Garonne compensate by their fertility for these barren tracts: they produce abundance of wheat, rye, barley, oats, and maize; so that the growth of corn in the department exceeds the consumption. Above half the soil is under the plough. Fruit-trees are numerous, especially plum-trees, which yield excellent prunes for exportation. The vineyards are extensive, and the produce is double the consumption. The wine is high-coloured and rich, well calculated for keeping and for bearing a sea voyage; but in other respects not of the best quality, except the red wines of Thésac, La Rocal, Buzet, and Péricard; and the white wines of Clairac and Aiguillon. Tobacco is cultivated on a large scale, and is the best grown in France; and hemp is of remarkably fine growth and excellent quality. The woods, consisting chiefly of pines, cork-trees, and chesnut-trees, occupy about an eighth of the department. There is a considerable quantity of meadow land, and the heaths and open pastures are tolerably extensive: the breed of oxen is good; and there are large flocks of sheep. Mules and asses are numerous, but horses are not so. Pigs have much increased of late years. Poultry also has been reared in increasing quantity, especially geese and turkeys, of which a great number are sent to other parts of France. Bees are numerous, also game and fish. The Garonne yields the salmon, the trout, and the lamprey, and even some sturgeons. There are wolves, foxes, rats, and moles.

The climate is considered to be one of the finest in France. There are however alternate periods of rain and clear weather of such length as frequently to injure the harvests. The winds are high, especially the north-west wind, which in summer frequently causes violent tempests. In the spring frequent fogs, accompanied with a light hoar frost, and followed by bright and intense sunshine, are very injurious to vegetation. The marshy exhalations of the landes give rise to dangerous bilious and intermittent fevers.

The department is divided into four arrondissements, as follows:—

Name.	Situation.	Area in sq. miles.	Population in 1831.	1836.	Communes.
Agen	S.E.	390	84,569	84,388	87
Marmande . .	N.W.	547	104,068	104,172	103
Nérac	S.W.	524	60,661	60,879	78
Villeneuve d'Agen	N.E.	596	97,587	96,961	86
		2,057	346,885	346,490	354

The number of cantons, or districts, each under a justice of the peace, is thirty-five.

In the arrondissement of Agen are Agen, Aiguillon, Port-Sainte-Marie, and Clermont, on the Garonne; Granges on the Lot; Puymirol on and Saint Maurin near the Saône; Beauville and La Sauvetat de Sauvères on the Senne, a feeder of that river; Astafort and Layrac on the Gers; La Roque-Timbaut, Castelautier and Prayssas in the country north of the Garonne; and La Plume, Moirax, Caudecoste, and Cuq, in the country south of the Garonne.

Agen is on the right bank of the Garonne. It is mentioned by Ptolemy, who makes it the capital of the Nitiobriges, a Celtic tribe: it is mentioned also in the Itinerary of Antoninus, in Ausonius, in the Notitia Imperii, and in the Peutinger Table: its Latin name was Aginnum or Agennum. Few towns suffered more severely in the irruption of the barbarous tribes that overthrew the Roman Empire, or in the troubled ages which followed. It was pillaged by Goths, Vandals, Alans, Suevi, and Burgundians; and at a later time by Saracens and Northmen. It was afterwards at different periods subject to the dukes of Aquitaine, the kings of France and England, and the counts of Toulouse: and in the religious wars of the sixteenth century it suffered again. The environs of the town are pleasant, but the town itself is ill built; the squares or open spaces are irregular, the streets narrow, crooked, and dirty: the houses are neither handsome nor convenient. The bridge over the Garonne is tolerably handsome; and the public walks, especially the 'Cours' on the banks of the Garonne, delightful. The public buildings most worthy of notice are the Church of St. Caprais, the Prefect's Office, and the Hospital of St. Jacques. The population in 1831 was 11,991 for the town, or 12,631 for the whole commune; in 1836 it was 13,309 for the commune. The manufactures are leather, serge, printed cottons and other cotton goods, sailcloth, iron goods, starch, and candles: trade is carried on in these articles, and in corn, flour, wine, and fruit, which are sent to Bordeaux. There are four yearly fairs. There are a public library of 11,000 to 12,000 volumes, a museum, a high-school, a society of arts, sciences, and agriculture; a departmental nursery, a theatre, and baths. Among the eminent natives of Agen are Sulpicius Severus, one of the Christian fathers, Joseph Scaliger, and Lacépède.

Agen is the seat of an antient bishopric; the diocese now comprehends the department: the bishop is a suffragan of the archbishop of Bordeaux. The city is also the seat of a Cour Royale, which has jurisdiction over the departments of Gers, Lot, and Lot et Garonne.

Aiguillon (pop. 2062 town, 4080 whole commune) is in a very fertile valley at the confluence of the Lot and the Garonne. A noble château was commenced here in 1790 by the Duke of Aiguillon and never finished. There are also (or were within the present century) the ruins of an antient castle, once of considerable strength. The inhabitants manufacture stockings, and trade in the produce of the neighbourhood. Port-Sainte-Marie (pop. 1976 town, 3079 whole com.) and Clermont are on the road between Aiguillon and Agen, very near each other.

In the arrondissement of Marmande are Marmande, Meilhan, St. Bazeille, Caumont, Le Mas d'Agenois, and Tonneins on the Garonne; Cocumont and Bouglon in the country south-west of that river; Castel-Moron, La Parade, La Fitte, and Clairac, on the Lot; Souvelat, Allemans, Pardaillan, and Duras, on or near the Dropt; Soumenzac, in the district north of that river, and Miramont, Levignac, Lauzun, Seiches, and St. Barthelemi, Puymiclan, Escassefort, Castelnau-sur-Gupie, Gontaut, and Verteuil, in the country between the Dropt, the Lot, and the Garonne. Marmande is an antient town which was pillaged by the Saracens. It is in a plain on the right bank of the Garonne, fertile rather than picturesque. Though an old town, it is tolerably well built. It has a handsome fountain and a high-school, the buildings of which are worthy of observation. The population in 1831 was 5261 for the town, or 7345 for the whole commune: in 1836 it was 7527 for the commune. The inhabitants manufacture coarse linens, bed-ticking, cordage, leather, and hats; and trade with Bordeaux in corn, wine, brandy, plums, and hemp. There are a public library and an agricultural society. Tonneins consists almost entirely of a long and broad street, lined with good and even elegant houses. The town-hall is in the centre of the town, in a handsome *place* or square, planted with elms, and commanding a view of the river. The inhabitants (3944 town, 6494 whole commune), nearly half of whom are Protestants, manufacture pins, rope, and hempen thread or yarn. Near the town is a snuff manufactory. Considerable trade is carried on. Clairac (pop. 2467 town, 4949 whole commune) was the first town in France which embraced the Reformed religion; it was formerly the rival of Tonneins in trade: its snuff was the most esteemed of any in France.

In the arrondissement of Nérac are Nérac, Moncrabeau, Lavardec, and Viane, or Viannes, on the Baise; Bruch, Francescas, Montagnac, Moncau, and La Monjoye, in the country east of the Baise; Sos and Mezin on the Gelize; Castel-Jaloux, Villefranche, Damazan, Saintraille or Xaintrailles, Lausseignan, and Durance, in the country west of the Baise and Gelize. Nérac consists of two parts, Great and Little Nérac, divided from each other by the Baise, over which is a handsome stone bridge. In Great Nérac is a fine Gothic castle, built by the English, which was for a long time one of the residences of the kings of Navarre. Henri IV. held his court there. In the religious wars of the reign of Louis XIII. it was taken by the duke of Rohan, the Protestant leader, who expelled the magistrates and the partisans of the royalist party; but the town was reoccupied the same night by the royalists, under the duke of Mayenne. Great and Little Nérac are both walled. The market-houses are very large. The population in 1831 was 3566 town, or 6327 for the whole commune: in 1836 it was 6603 for the commune. Among the manufactures of the town are hosiery, leather and starch; there are several corn-mills; the flour is exported or made up into sea-biscuit, or into patties, highly esteemed by epicures. Mezin (pop. 1962 town, 3146 whole commune) has many water-mills in or about the town. Cork-cutting and tanning are carried on, and there is manufacture of coarse earthenware in the neighbourhood. Castel-Jaloux was one of the places which took part with the Huguenots in their struggle against Louis XIII., but was obliged to submit. Paper, leather, and coarse woollens are manufactured; and considerable trade is carried on in cattle, wine, honey, and paper.

In the arrondissement of Villeneuve d'Agen are Villeneuve d'Agen, Fumel, Libos, Penne, Chasseneuil, Sainte-Livrade (pop. 3143), and Le Temple on the Lot; Tournon (pop. 7901) on the Bondusson; Frespech, Pujols, Dolmayrac, and Montpezac or Montpezat, in the country south of the Lot; Sauveterre, Paulhiac, Monflanquin (pop. 5201), La Ledat, Castelnau-de-Combes, Cancon, Montau, or Montaut le Jeune, and Monclar, between the Lot and the Dropt; and Villeréal, Castillonnes, and Cahuzac on the Dropt. Villeneuve d'Agen, or Villeneuve-sur-Lot, has an antient castle, and some remains of the antient town-walls, which have in most parts been replaced by handsome walks. The town, which was built in the thirteenth century, is well laid out. There is an old bridge over the Lot; the principal arch has about 115 feet span, and is 58 high. The population in 1831 was 5934 town, or 10,652 whole commune; in 1836 it was 11,222 for the commune: the inhabitants are engaged in tanning, and carry on trade in corn, wine, plums, cattle, and linen. There are paper-mills and iron-works near the town. There are two yearly fairs. There are a high-school and an agricultural society. Fumel has some paper-mills; and at Penne (pop. 6005) some manufactures of leather and other articles are carried on.

The population of the above places, when not otherwise specified, is that of the whole commune, from the census of 1831.

The chief branches of manufacture are corks, sailcloth, light woollens, quilts and other cotton goods, snuff, earthenware, and gloves. There are also glass-houses, tan-yards, paper-mills, and iron-works. The number of iron furnaces for producing pig-iron is five; charcoal is the principal fuel used: there are twelve forges for the preparation of wrought-iron. The chief trade of the department is in wine, brandy, flour, prunes, hemp, deals, resin and pitch. These articles are sent chiefly to Bordeaux or Toulouse, the conveyance to these towns being facilitated by the navigation of the Garonne.

The department constitutes the diocese of Agen, and is in the jurisdiction of the Cour Royale of that city, and of the Académie Universitaire of Cahors. There are five Protestant consistories in the department, viz. at Clairac, Tonneins, Nérac, Lafitte, and Castelmoron. The department is in the eleventh military division, the head-quarters of which are Bordeaux. It returns five members to the Chamber of Deputies.

The department for the most part formed part of the territory of the Nitiobriges, but it includes probably small portions of the country of the Petrocorii and Vasates. Aginnum (Agen) and Excisum (on the site of Villeneuve d'Agen) were towns of the Nitiobriges. In the Roman division of Gaul, the department was comprehended in Novempopulana, a subdivision of Aquitania. It was afterwards successively under the Visigoths and the Franks; and was exposed to the ravages of the Gascons or Vascons, the Saracens, and the Northmen or Normans. It suffered also in the crusade against the Albigenses; and was ceded to the English by the treaty of Bretigny. It was one of the districts which early received the doctrines of the Reformation. Before the Revolution it constituted part of Agenois and Bazadois, subdivisions of Guienne; and of Condomois and Lomagne, subdivisions of Gascogne.

LOTHAIRE. [GERMANY.]

LOTHARINGIA. [LORRAINE.]

LOTHIANS is a term under which that part of Scotland is comprehended which stretches along the southern shores of the Frith of Forth, and includes the three counties of Haddington, Edinburgh, and Linlithgow. The first of these counties is also called East Lothian, the second Mid Lothian, and the last West Lothian. This region lies between 56° 40′ and 56° 5′ N. lat., and between 2° 24′ and 3° 50′ W. long.

Coast-Line.—The Lammermuir Hills terminate on the east in Berwickshire with the bold and rocky promontory of St. Abb's Head, which attains the elevation of 286 feet above the sea. From this point the coast, trending north of west, continues rocky and steep as far as Fast Castle, and its average elevation is hardly less than 200 feet. Farther west it sinks lower, but still presents precipices and crags to the sea, which rise to about the height of 100 feet. Its character is somewhat changed where Haddingtonshire begins: though it continues to be rocky, the shores rise with a gentle slope to a moderate height; but west of Dunbar Castle craggy cliffs and precipices again appear, which at last disappear under the sands of Belhaven. A low and sandy beach extends on both sides of the mouth of the Tyne; on the north it continues to the mouth of the Peffer, with the exception of the small promontory of Whitberry, which rises to a moderate elevation. But north of the mouth of the Peffer the cliffs are precipitous and rugged, in some places not less than 100 feet high, and overhang the sea. Tantallan Castle stands on a high rock surrounded by the sea on three sides. The coast continues high, but less precipitous, as far as New Berwick: west of that place it is flat and sandy for eight miles; but as we advance farther westward it becomes rocky near Chapel Ness, and in some places almost bold: this character continues to Gulan Ness. The beach of Aberlady Bay is flat and sandy, and so is the remainder of the shores of East Lothian, except some small portions of it near Graigielaw, Boglehill, and west of Preston Pans, where it is several feet high. The shores of Mid Lothian are low and sandy as far as Leith, and some miles farther west; but as we approach the mouth of the river Amond, which forms the boundary between Mid and West Lothian, they are intersected by some hills of moderate elevation. The coast rises somewhat higher west of the Amond, where it attains, on an average, an elevation of between 50 and 60 feet, and so it continues as far as Black Ness, where it begins to lower, until, west of Borrowstounness, it sinks so low that more than 2000 acres are covered by the tide.

Surface, Soil, and Rivers.—Nearly all the high lands in which the rivers originate that flow southward to the Tweed, and northward to the North Sea and Frith of Forth, lie within the Lothians, and the elevated ground which constitutes the northern edge of the basin of the Clyde extends along their boundary. The whole region may be considered as divided by nature into three portions. The most eastern comprehends the whole of East Lothian and a small portion of Mid Lothian, having for its natural boundary a range of hills which constitute the eastern boundary of the basin of the Esk, and extend from Borthwick to Inveresk: they are called, at least towards their northern termination, the Hills of Falside and Carberry. The second portion comprehends the country between this range and the Leith Water, and contains the Pentland Hills. The third division extends from Leith Water to the river Avon, which separates West Lothian from Stirlingshire.

The eastern region comprehends the greater portion of the Lammermuir range, of which the remainder belongs to Berwickshire. These hills constitute within East Lothian a continuous chain, beginning at the Lammerlaw (about 2° 50′ W. long.), and running north-east to the Sayers Law; their course thence to St. Abb's Head is nearly east. The highest summits of this chain are Lammerlaw, about 1700 feet, and Sayers Law, 1739. Towards the north this ridge terminates rather abruptly; but towards the south it sends off several ridges, which extend in a south-eastern direction, and contain several high summits. Spartleton or Spartledown Law is 1620 feet high. That portion of East Lothian which is included within the Lammermuir Hills contains many deep valleys, through each of which flows a river scarcely perceptible in summer, but in winter forming a very considerable torrent. The beds of the rivers are wide, and formed by the débris of the mountains through which they flow. The valleys are rather narrow and of moderate fertility, but they are under cultivation. The hills are mostly covered with muir or moss, but are capable of improvement. This elevated district is sometimes covered with snow for three months.

From the Lammerlaw a series of hills extends south-westward to Fala Hill. They are connected by high ground with one another, and are commonly called the Soutrie Hills, from one of the highest summits. They attain an elevation of near 1000 feet. West of them the watershed between the Gala Water, a tributary of the Tweed, and the Borthwick, is formed by a table-land of an uneven surface, but without any distinct ridge. It extends on both sides of the Gore Water, a tributary of the Esk, and is called Borthwick Muir. Its elevation above the sea is between 500 and 600 feet, and its surface is chiefly covered with moss or heath. The Gore Water runs in a narrow and deep valley of very moderate fertility. In this muir, north-west of Borthwick, rise the Falside and Carberry Hills, which run northward between Crichton and Cranston on the east, and Cockpen and Dalkeith on the west, and terminate two miles south-east of Inveresk. Their elevation varies from 500 to 700 feet.

The country between the Soutrie Hills, Borthwick Muir, and the Carberry ridge partakes much of the character of the muir, but the elevations are higher, being on an average 200 feet above the base, which, near the Soutrie Hills, is 600 feet above the sea, though it lowers considerably farther north. Most of this tract is covered with heath, but other portions are green, though they are intersected with bogs. Along the rivers there are small tracts of good land.

The country skirting the Lammermuir Hills on the north is rather undulating than hilly: its elevations have gentle slopes, and rise hardly more than 100 feet above their base, which varies in height above the sea from about 600 feet near the hills to 250 feet towards the Tyne. The highest hills in this tract are Skimmer Hill near Salton (600 feet above the sea) and Down Hill near Scott (550 feet). This tract does not contain much moorland; and though many parts near the Lammermuir have a sandy and rather sterile surface, the remainder is tolerably fertile, and produces good crops. The northern boundary-line of this tract begins on the east at Broxmouth, east of Dunbar, and follows a low ridge of elevated ground which runs westward near Spott, Stenton, Garvald, and Gifford, whence it passes to Salton.

From this line the country slopes gradually towards the river Tyne, without forming any hills, except the Traprain Hill, in the parish of Preston-kirk, which rises abruptly on all sides, and on the south is nearly perpendicular. This district, which is between two and four miles wide, contains the most fertile lands of East Lothian, and produces very rich crops of wheat and other grains. Along the Tyne there are rich meadow-lands, especially towards the mouth of the river.

The Tyne originates in two branches in the Carberry Hills and on Borthwick Muir. The northern branch, called the Tyne, unites with the southern, called Salton Water, near Salton House: at the junction the latter is the more considerable river. From Salton House the river runs in a general north-east direction with numerous windings to its mouth. At Linton it traverses a ledge of rocks, which formerly caused a waterfall about two feet high, but the rock has been lately cleared away. The tide ascends the river two miles from its mouth. The whole course of the Tyne is about 30 miles.

From the Hills of Falside, south-east of Inveresk, some high ground runs in a north-east direction, being nearly equally distant from the churches of Tranent and Pencaitland. Farther east the churches of Gladsmuir and Adelstanford are built on its highest elevation, and between them are the Garleton Hills, the most elevated part of these high lands. From Adelstanford they extend eastward to the village of Linton, where they terminate with a very gradual descent. The soil on these high lands is of inferior quality; but on the gentle declivities, with which they sink towards the sea and the river Tyne, it is characterized by fertility, especially on the southern slope, which terminates near the Tyne in rich meadows.

The northern slope of this ridge terminates east of the Garleton Hills in the valley of the Peffer. This valley traverses East Lothian from Aberlady Bay on the west to Peffer Sands on the east. The rivulet which traverses it, the Peffer, rises in a swampy meadow east of Congleton, and immediately divides into two branches, of which one flows eastward, and enters the sea north of Tyningham, and the other runs slowly to Aberlady Bay. The former runs about five and the latter about eight miles. Their common source is said to be 25 or 30 feet above the sea. The valley, which is from one to two miles wide, was formerly occupied by swampy grounds, which have been drained and converted into meadows and fields of considerable value.

The tract of land north of the valley of the Peffer is chiefly occupied by some high ground running nearly west and east from Gulan Ness to Tantallan Castle. South-east of New Berwick is the New Berwick Hill, which is 800 feet high. The more elevated portion of this region is not cultivated, but the lower ground produces moderate crops of grain. Some large tracts near the sea-shore are low, and mostly covered with sand.

The south-eastern portion of the *middle* region, which extends from Carberry Hill to Leith Water, may be considered as a continuation of Borthwick Muir, to which it is contiguous. The whole tract between the Borthwick Muir and the two great branches of the Esk is a table-land, on which numerous small hills are dispersed, and which in the southern parts is about 600 feet above the sea; but towards the union of the two Esks, about two miles south of New Battle, it gradually sinks down to a lower level. The higher part of this tract, like Borthwick Muir, is covered with heath or consists of moorland, and contains only narrow strips of land along the rivers suitable for agricultural purposes. The hills which occur along the watershed between the Esk and the tributaries of the Tweed rise between 100 and 200 feet above their base: it is only near the source of Moorfoot Water that they attain a much higher elevation, the Blackhope Scares, east of the course of the river, rising to 1850 feet, and Coatlaw, west of it, to 1680 feet.

The Pentland Hills occupy the greatest part of the country between the Esk and Leith Water. The southern portion of these hills, running along the boundary-line of Mid Lothian and Peebles, is called Cairnedge, and contains the Cairnhill, about 1800 feet high. This ridge runs nearly east and west, and at its eastern extremity is connected with the Bevelaw-edge, the highest part of the Pentland Hills, whose summits in general attain an elevation of from 1300 to 1600 feet. Logan-house Hill is more than 1700 feet high, and Capelaw 1550; Caerketan with which the range terminates, south-east of Collington, attains about 1450 feet. The highest summits occupy nearly the middle of the tract between both rivers, but their declivities and offsets generally extend to the very banks of the streams or to a short distance from them. The base on which the Pentland Hills stand does not appear to exceed 600 feet in elevation; the sides of the hills are steep, and are only used as sheep-walks; in the narrow valleys the arable land, which occurs only in small patches, is of moderate fertility.

The northern declivity of the Pentland Hills terminates on the east at Laswade, and farther west a mile south of Liberton and about the same distance east of Collington. The country to the north of this line and extending to the shores of the Frith of Forth presents in general an undulating surface with a few hills on it, among which Arthur's Seat, near Edinburgh, is the highest. The most elevated part of this tract may be from 250 to 300 feet above the sea, but it lowers gradually as it approaches the Frith, where it terminates in a low shore. It contains the most fertile and best cultivated portion of Mid Lothian, though its soil is far from being of the first quality.

The *western* region, comprehending the western districts of Mid Lothian and the whole of West Lothian, contains in the southern parts extensive tracts covered with mosses and heath. The surface frequently extends in plains, and hills of moderate elevation are not common, except in some places on the watershed between the rivers which fall into the Frith and the tributaries of the Clyde. Some of these hills attain a height of 900 or 1000 feet; and the most western, the Levens Seat, is probably more than 1200 feet above the sea. The rivers do not run in narrow glens, as in the moorlands east of the Pentland Hills, and the arable ground along their banks is much more extensive and more fertile; but the greater portion of the tract is unfit for agricultural purposes. A line drawn from Currie on the Leith Water to Kirknewton and Mid Calder in Mid Lothian, and thence to Livingstone and Bathgate in Linlithgow, may be considered as the northern boundary of this tract.

The country north of this line resembles in soil and surface the tract north of the Pentland Hills, but the differences in the level are much greater, and its descent is far from being so uniform. The greatest portion of this country does not slope towards the sea, but towards the river Amond, which traverses it nearly in the centre. The basin of that river is bordered by higher ground, which in some places rises into hills. Of these hills there are in Mid Lothian the three hills of Dalmahoy and Kaims between Leith Water and Ormiston Water, of which the most southern attains 680 and the most northern 660 feet; and the Corstorphine Hills, west of Edinburgh, which extend two miles from south-east to north-west, and rise to 460 feet; they are steep towards the east and north. The hills which rise on the borders of the basin of the Amond in West Lothian occupy a larger surface. They begin east of Bathgate and run northward under the names of Dumcross Hills, Knock Hills, and Kipp Hills; east of Torpichen is their highest summit, the Cairn Naple, which is 1498 feet high. They terminate south of Linlithgow with the Cocklerue, 500 feet high. From the last-mentioned hill the high ground runs eastward, forming moderate elevations with gentle descents until it terminates a short distance from the mouth of the Amond. The country enclosed by these high grounds contains a greater portion of arable ground than any other part of the Lothians, except the Vale of the Tyne.

The south-eastern portion of Mid Lothian belongs to the basin of the Tweed. Though contiguous to the Muir of Borthwick, it presents a different character, its surface being formed by ridges of high hills, between which the rivers run in deep and mostly narrow valleys. The hills rise probably to 1000 feet; the Tippetknows, on the boundary-line between Mid Lothian and Berwickshire, attains 1323 feet. The arable ground in the valleys is of only moderate fertility, but the hills afford good sheep-walks.

Geology.—The Lammermuir Hills consist of a series of transition rocks. They are almost entirely composed of grauwacke, distinctly stratified, but in various places trap rocks protrude through the strata, and between the ridges old red sandstone occurs, which fills up to a certain level most of the valley, especially along the rivulets. Along the northern declivity the hills are covered by a conglomerate, consisting almost entirely of fragments of grauwacke slate coarsely cemented together, and forming in many places large and elevated mountain-masses. This conglomerate is frequently traversed by rocks of a coarse sandstone and projecting dikes or veins of trap, and extends to some distance from the hills. The lower ridges which skirt the hills are composed of the red sandstone, which extends to the ridge running from Broxmouth to Gifford, and then, at least towards the sea, is followed by a low tract belonging to the coal-formation; for though it is covered with a deep and fertile soil, the cliffs along the shore as far as Dunbar exhibit limestone, clay, ironstone, bituminous shale, and occasionally thin seams of coal, with some organic remains.

In the country north of the Tyne the surface consists of claystone, clinkstone, and limestone, where it is not covered with mould. The upper stratum however is partly traversed by and partly rests on the red sandstone, which forms the regular strata of this district. The sandstone rests on the transition rocks of the Lammermuir Hills, and is in some places covered by the coal-formation of Mid Lothian. In a few places basalt and trap rocks are met with.

On the western extremity of the Lammermuir Hills the coal-formation begins, which extends through the whole of the southern districts of Mid and West Lothian. The great coal-field lies to the east and south of Edinburgh, where it extends about 25 miles in length, its greatest breadth being six miles. It is calculated to cover an area of 80 square miles. Though the coal-formation continues farther westward, it is intersected by extensive tracts of limestone and sandstone, in which only small seams of coal occur. But in the hills near Bathgate the coal-formation again predominates, and beds of coal occur there which are fit for working, and extend westward into Lanarkshire. The country between the coal-formation and the Frith of Forth belongs to the red sandstone, consisting mostly of limestone and sandstone, through which at several places trap and basalt rocks protrude.

Lothian, under the names of Landen, Lodoneia, and Lothian, antiently comprehended all the country lying between the rivers Tweed and Forth as far west as the river Avon, which separates the counties of Linlithgow and Stirling. It consequently included the whole of Berwickshire and part of the counties of Roxburgh, Selkirk, and Peebles, in addition to the three counties of Haddington, Edinburgh, and Linlithgow, which three alone constitute the district now known under the appellation of the 'Lothians.' This fertile district was inhabited by the British until their expulsion by the Saxons about the middle of the fifth century. Soon after the union of the Picts and Scots (A.D. 843) Kenneth Macalpine made incursions into Saxonia, as Lothian was then called, but did not succeed in obtaining any permanent possession. It subsequently became included in the bishopric of Durham, and in the year 1020 was ceded to Malcolm II. by the duke of Northumberland, but Lothian continued to be known as a country distinct from Scotland even as late as the reign of David I. (A.D. 1124). The eastern boundary appears to have been restricted to the Lammermuir hills about the middle of the twelfth century, during the reign of William, surnamed the Lion, and to have been then also first divided into East Lothian [HADDINGTONSHIRE], West Lothian [LINLITHGOWSHIRE], and Mid-Lothian [EDINBURGHSHIRE].

With reference to Edinburghshire, the following table, showing the state of the parish-schools of that county at the end of the year 1825, has been compiled from the Returns made by the parochial ministers to Parliament in 1826. In the parishes of Canongate, College Church, High Church, Lady Yesters, New Grey Friars, New North Church, Old Church, Old Grey Friars, St. Andrew, St. Cuthbert, St. George, St. Mary, Tolbooth Kirk, and Tron Church, there are no parochial schools, but in these, as in most of the other parishes, there are schools established on what is called the 'legal provision,' besides private schools, and the number of scholars attending them is very considerable. (Camden's *Brit.*; Chalmers's *Caledonia*; *Old* and *New Statistical Account of Scotland*, &c.)

Parish.	Salary and Emoluments of Schoolmaster in 1825.		Subjects taught, and School-fees per quarter.	Average No. of Scholars.
	£ s.	£ s.		
Borthwick	Salary 20 0,	fees 30 0	English reading, writing, and arithmetic 3s. 6d.; Latin 6s, book-keeping and practical mathematics 6s., geography 2s. 6d.	80—90
Mid-Calder	„ 37 0 and house.		English, writing and accounts, Latin, Greek, and French	50
West Calder	„ 350 merks Scotch,	fees 25*l*.	English 2s., writing 2s. 6d, arithmetic 3s., Latin 5s.	80
	£ s.	£ s.		
Carrington	„ 22 0	„ 30 0	Reading 2s. 6d., writing 3s., arithmetic 3s. 6d., Latin 5s.	55—60
Cockpen	„ 22 0	„ 18 12	English, writing, and arithmetic 3s.	50
Colinton	„ 22 0	„ 30 6	Reading 3s. 2d., writing 4s. 2d., arithmetic 5s. 2d., Latin 7s. 6d.	60
Carstorphin	„ 22 0	„ 16 0	English, writing, and arithmetic 3s. 6d.	50
Cramond	„ 22 0	„ 68 0	English 2s. 6d., writing 3s., arithmetic 3s. 6d., grammar 4s. 6d. Latin 5s. 6d., French 5s. 6d.	70
Cranston	„ 22 0	„ 20 0	English 2s. 6d., writing 3s., arithmetic 3s. 6d., grammar 5s. 6d.	65
Crichton	„ 19 12	„ 23 0	„ Latin 5s. 6d. Practical mathematics 5s. 6d.	70
Currie	„ 20 0	„ 20 0	English 2s. 6d., writing 3s 6d., arithmetic 5s., Latin 5s.	45
Dalkeith	„ 20 0	„ 67 0	Latin, Greek, and French 10s. 6d.	25
Duddingston	„ 22 0	„ 24 0	English, writing, and grammar 3s. 6d., arithmetic, geography, book-keeping, &c. 4s.	45
Fala and Soutra	„ 19 0	„ 45 0	English 2s. 6d., writing 3s., arithmetic 4s, Latin, Greek, and French 6s.	60
Glencarse	„ 22 0	„ 23 0	English 2s. 6d., writing 3s. 6d., arithmetic 4s. 6d., Latin 6s.	45
Heriot	„ 19 0	„ 12 0	English 2s., writing 2s. 6d., arithmetic 3s.	30
Inveresk (Grammar-school)	„ 27 0	—	Latin, Greek, French, mathematics 10s. 6d.	70
Do. (2 English)	—		English, writing, and arithmetic 5s.	200
North Leith	No return.		English, writing, and arithmetic 4s. 6d., Latin and mathematics 5s.	40
	£ s.	£ s.		
South Leith	„ 40 0	„ 120 0	English, reading, and grammar 7s. 6d, Latin 10s. 6d.	140
Liberton	„ 22 0	„ 56 0	English 3s., writing 4s., arithmetic 5s., Latin 7s. 6d.	90
New Battle	„ 22 0	„ 12 0	English, writing, and arithmetic 3s. 6d.	40—45
Newton	„ 22 0	„ 50 0	English 2s. 6d, writing 3s., arithmetic 3s. 6d., Latin 5s.	90
Pennycuick	„ 22 0	„ 15 0	English, writing, and arithmetic 5s., Latin 7s. 6d.	46
Ratho	„ 22 0	„ 36 0	„ 4s 6d. „ 6s.	80
Stow	„ 22 0	„ 18 0	Reading and writing 2s. 6d., arithmetic and Latin 5s.	45
Temple	Salary and fees 60*l*.		English, writing, and arithmetic 3s. 6d.	50

LOTIONS, or washes, termed also epithems, and when intended for the eye, collyria, or eye-washes, are either mixtures of different ingredients, or solutions of various medicinal substances, in water or other menstrua, designed for external application. If the object be to reduce the temperature of a part, they are generally formed of spirituous or other volatile principles, which by their evaporation occasion cold (and such must be applied by means of a very thin single layer of linen), or of saline bodies, which at the moment of their solution cause a reduced temperature, and which should be applied immediately after being mixed, and frequently renewed. Others are composed of stimulating substances, and are intended to impart power to indolent tumours or ulcers, while a different set are designed to allay pain, and are composed of sedative or narcotic principles.

Many of the nostrums sold under the name of lotions are solutions of very active ingredients, and their application is often productive of very serious effects.

LOTTERIES are schemes by which some modern governments have raised a revenue from their subjects, by taking advantage of that feeling of confidence in their own good fortune which is entertained by a large proportion of mankind. The plan upon which lotteries have generally been conducted is that of selling for more than their intrinsic worth a certain number of tickets or chances, and distributing by lot a part only of the money thus collected among a comparatively small number of the purchasers. Lotteries may thus be considered as games of chance, the aggregate number of players in which are sure to lose a part of their venture. During the period in which the English state lotteries were carried on by act of parliament, it was the plan to distribute in prizes of different magnitudes an amount equal to 10*l*. for each ticket or chance that was issued, and the profit to the state consisted of the sum beyond that rate which contractors were willing to give for the privilege of selling to the public the tickets or shares of tickets, which for that purpose they might divide into halves, quarters, eighths, and sixteenths of tickets. The price paid by the contractors for this privilege varied with circumstances, but was usually about six or seven pounds per ticket beyond the amount repaid in prizes, while the price charged by the contractors to the public was generally four or five pounds per ticket beyond that paid to the government, and more than this rate of advance was always required when the tickets were divided into shares, the smaller shares being charged more in proportion than the larger.

The invention of lotteries is ascribed to the Romans. It does not appear that they were resorted to for purposes of revenue, but rather as a means of amusing and gratifying the people, among whom the chances were gratuitously distributed, the prizes being of but little value. The earliest English lottery of which there is any record occurred in 1569, when 40,000 chances were sold at ten shillings each; the prizes consisted of articles of plate, and the profit was employed for the repair of certain harbours. In the course of the following century the spirit of gambling appears to have materially increased in this direction, for *private* lotteries were, early in the reign of Queen Anne, suppressed 'as public nuisances.' In the early period of the history of the National Debt of England, it was usual to pay the prizes in the state lotteries in the form of terminable annuities. In 1694 a loan of a million was raised by the sale of lottery tickets at 10*l.* per ticket, the prizes in which were funded at the rate of 14 per cent. for sixteen years certain. In 1746 a loan of three millions was raised on 4 per cent. annuities, and a lottery of 50,000 tickets at 10*l.* each; and in the following year one million was raised by the sale of 100,000 tickets, the prizes in which were funded in perpetual annuities at the rate of 4 per cent. per annum. Probably the last occasion on which the taste for gambling was thus made use of occurred in 1780, when every subscriber of 1000*l.* towards a loan of twelve millions at 4 per cent. received a bonus of four lottery tickets, the intrinsic value of each of which was 10*l.*

In 1778 an act was passed obliging every person who kept a lottery-office to take out a yearly licence, and to pay 50*l.* for the same, a measure which reduced the number of lottery-offices from 400 to 51.

The immorality on the part of the government, in thus encouraging a spirit of gambling among the generality of the people, became very soon apparent. By limiting the subdivision of chances to the sixteenth of a ticket as the minimum, it was intended to prevent the labouring population from risking their earnings, but this limitation was extensively and easily evaded by means which aggravated the evil, the keepers of these illegal offices (commonly known as 'little goes') and insurance offices requiring extra profits to cover the chances of detection and punishment. All the efforts of the police were ineffectual for the suppression of these illegal proceedings, and for many years a great and growing repugnance was in consequence manifested in parliament to this method of raising any part of the public revenue. At length, in 1823, the last act that was sanctioned by parliament for the sale of lottery tickets contained provisions for putting down all private lotteries, and for rendering illegal the sale, in this kingdom, of all tickets or shares of tickets in any foreign lottery, which latter provision is, to this day, extensively evaded.

The system of state lotteries was very long carried on by the French government, and was the cause of still greater demoralization than in England. Recently, state lotteries have also been abolished in France.

The Hamburg lottery, which is still continued, is established upon a fairer principle than was adopted in France or England. The whole money for which the tickets are sold is distributed among the buyers, except a deduction of 10 per cent. which is made from the amount of the prizes at the time of their payment.

Lotteries have been very common in the United States, and have been sanctioned by the several states, not so much as a means of raising money for state purposes, as with the view of encouraging, as they supposed, many useful objects which could only be effected by raising at once a large sum of money, such as canals, the establishment of schools, and even the publication of a book. The numerous frauds practised in lottery schemes in the United States have perhaps done more to open the eyes of the people to the mischief resulting from them than any investigation into the true principles of lotteries. A distinguished American lawyer, who figured in the New York State Convention about twenty years ago, declared that though 'he was no friend to lotteries, he could not admit they were *per se* criminal or immoral, when authorized by law. If they were nuisances, it was in the manner in which they were managed. In England, if not in France, there were lotteries annually instituted by government, and it was considered a fair way to reach the pockets of misers and persons disposed to dissipate their funds. The American Congress of 1776 instituted a national lottery, and perhaps no body of men ever surpassed them in intelligence and virtue.' These remarks are merely quoted in order to show what a man of high character in America for integrity and knowledge thought of lotteries twenty years ago. The opinions which he expressed were at that time, we can venture to say, shared by a great number. We should be inclined to think that juster views are now prevailing there as to the subject of lotteries: but we have no recent information on the subject.

LOTUS of the Antients. The plant or plants referred to by classical authors under the name of Lotus is a subject which has engaged the attention of numerous commentators as well as of botanists. To the difficulty of ascertaining the identity of a plant but imperfectly described has in this case been added that of the same name having been applied to several very distinct plants. Fée, the latest author (*Flore de Virgile*), enumerates no less than eleven to which the name Lotus was applied: it is unnecessary here to enumerate more than the most remarkable. Of these, some are herbaceous, others perennial. Among the former are the *Lotus sativa* and *sylvestris* of Dioscorides: the first, he states, is also called *trifolium;* it is supposed by some botanists to be *Melilotus officinalis*, and by others to be *M. cærulea*. Dr. Sibthorp has fixed upon *Melilotus messanensis* as the plant.

The *Lotus sylvestris* of Dioscorides, called also *libyon*, a native of Libya, and about two feet high, with leaves like those of Lotus trifolium, and fruit like that of fenugreek, is thought to be the Trigonella elatior of Sibthorp, which he found in Asia Minor and in Cyprus. Both kinds are described by the Arabs under the name of *handachocha*, or *hundkookee*, with *garch* and *thusf* as other Arabic names. From the great number of similar plants of the tribe of Loteæ which are employed by Asiatics as articles of diet or as medicines, it is impossible, without specimens, to identify either of the above, but they are probably allied to the Melilotus.

Lotus ægyptia, or the Egyptian Lotus, is no doubt one of the *Nymphæaceæ*, being described as springing up in Egypt in fields inundated by the river, with a stem like that of the κύαμος, or Egyptian bean (*Nelumbium speciosum*), and a white liliaceous flower, which rises out of the water at sun-rise, and sinks down again at its setting, a capsule like that of the poppy, in which are contained seeds which the Egyptians roast and make into bread, with a root which is likewise eaten, both in a dressed and undressed state. The plant is no doubt the *Nymphæa Lotus* of botanists. But as in the most antient monuments a blue-coloured lotus is likewise represented, there is no doubt that the Egyptians were also acquainted with the *Nymphæa cærulea*. At the present day, the seeds of several Nymphæas roasted in sand are eaten by the natives of India, as are likewise the stalks and the rootstocks, which is said to have been the case with the Egyptian species. As the flowers of the Nymphæaceæ are so highly esteemed by the Hindus, and notices respecting them constantly occur in their poetry and mythology, it is possible that an Eastern legend may have given origin to the metamorphosis of the nymph Lotis, flying from Priapus, into the 'aquatica lotos.' (Ovid, *Metamorph.*, ix. 341.)

The Egyptian lotus however is not so celebrated as another less known tree, to which exaggerated description has assigned a fruit of the most delicious kind, upon which the Lotophagi lived, and which, when strangers had once tasted, they ceased to wish to return to their native country. This is specially described as a tree, but there is no doubt that several have been confounded under this name. One is described both by Dioscorides and Pliny as a native of Italy of great size, forming excellent wood, with fruit about the size of pepper and as resembling that of the cherry. This description applies very closely to the Celtis Australis, or European lote or nettle-tree, which is one of the largest timber-trees of the South of Europe, with wood of considerable hardness and toughness. It produces berries about the size of small cherries and with long stalks like them, eaten both by birds and children.

This however comes far short of the character of the Lotus of the Lotophagi, of which the best description, according to Sprengel, is that of Polybius, who states that it was a moderate-sized thorny tree, with leaves like those of Rhamnus, but broader; that the fruit at first was like the white berries of myrtle, but become as large as an olive, of a reddish colour, and containing a small nut, taste sweetish, resembling that of figs or dates; and that a wine was prepared from it. That this tree was a native of Africa we know from the Lotophagi, who employed the fruit as their chief food, being a people of the African coast near the Syrtes. (Herod., iv. 177.) Arabian authors, in their translation of the works of the Greeks, give the synonyms in both languages, and we have, in the chapter of Serapion, retranslated into Latin, 'De loto arbore,' the name *sidr* or *sidar*, given as the Arabic name of the tree, and *nabach. nibuk*, or *nabk*, as that of its fruit. This name has been long known as that of a species of Zizyphus, and has been applied by botanists to one species, *Z. Napeca.* Dr. Shaw, in his 'Travels in Barbary,' figures a species of Zizyphus, which he calls 'Seedra Arabum, quæ et Lotus veterum.' It is a prickly branching shrub, with fruit of the size of a wild plum, and of a sweetish taste and saffron colour. He found it sold in the markets, cattle fed with it, and a liquor drawn from it. Desfontaines also found this *Zizyphus Lotus* on the same coast, and has fully described it. Mungo Park found a species of Zizyphus in the interior of Africa, which forms a large tree with yellow farinaceous berries of a delicious taste. The natives, he says, convert them into a sort of bread, by exposing them some days to the sun, and afterwards pounding them gently in a mortar, until the farinaceous part is separated from the stone. This meal is then mixed with a little water, and formed into cakes, which, when dried in the sun, resemble the sweetest gingerbread. It may be added, that the fruit of several species of Zizyphus is eaten in India. One kind, commonly known by the name *ber*, forms a moderate-sized tree in a cultivated state, with oval fruit of a yellowish or reddish colour, and about the size or somewhat smaller than a common plum, which is much esteemed. The taste is mild and sweet, with a slight degree of acidity, probably coming nearer to the taste of dates than any other fruit. In Persian works, *berree* and *jharree* are given as its Hindustanee, *kinar* and *khial* as its Persian, and *sidr* as its Arabic name, with *nebbe* for the fruit. The fruit of the wild kind is dried and powdered, as was done with the lotus of the Lotophagi. This powder, in Arabic, is called *savikoon-nebbek*, in Persian, *arud-i-kinar*, and in Hindu, *ber-choonee.*

LOUDE'AC, a town in France in the department of Côtes du Nord, near the river Oust, a tributary of the Vilaine, and on the southern slope of the Menez mountains. The population in 1831 was 6736 for the whole commune; in 1836 it was 6865 for the commune. The principal manufactures are linen-thread and linens, which also constitute the chief articles of trade. There is a monthly fair for linens, horses and cattle. There are an agricultural society and an institution for instruction in drawing. There are some fiscal government offices.

Loudéac is the capital of an arrondissement which contains 551 square miles. It is divided into nine cantons, and fifty-six communes. The population of the arrondissement was 98,604 in 1831; 95,102 in 1836: a considerable number of the inhabitants are engaged in the linen manufacture.

LOUDUN. [VIENNE.]

LOUGH DIVER, a provincial name for the bird called the *Smew* (*Mergus albellus*, Linn.).

LOUGHBOROUGH. [LEICESTERSHIRE.]

LOUGHREA. [GALWAY.]

LOUIS (LUDWIG in German, LUDOVICUS in Latin) is the name of many kings of France. Louis I., called 'le Débonnaire,' and also 'the Pious,' son of Charlemagne, was made his father's colleague in the empire, A.D. 813, and after the death of Charlemagne, in the following year, he succeeded him as king of France and emperor of the West. Bernard, son of Pepin, elder brother of Louis, had been made by his grandfather king of Italy, or rather Lombardy ('quæ et Longobardia dicitur' are the expressions of the chroniclers), which kingdom was defined in Charlemagne's will as being bounded by the Ticino and the Po as far as the territories of Reggio and Bologna. All to the west of the Ticino and south of the Po was then annexed to the French crown. Bernard, having conspired to supplant his uncle in the empire, was seized by order of Louis, and his eyes were put out, in consequence of which he died in a few days. Louis showed great sorrow for this act of cruelty, to which he had been advised by his courtiers, and he did public penance for it before an assembly of bishops. In the year 820 Louis appointed his son Lotharius king of Italy and his colleague in the empire. To his son Louis he gave Bavaria, Bohemia, and Carinthia, and to his other son, Pepin, he gave Aquitania. In 830 Lotharius and Pepin revolted against their father, on the plea of the bad conduct of their step-mother Judith of Bavaria, a licentious and ambitious woman. At a diet however which was [illegible] held at Aix-la-Chapelle, the father and sons were reconcil[illegible]d. T[illegible] sons revolted again in 833, and their father, being [illegible] by his followers, was obliged to give himself up [illegible] Lotharius, who took him as prisoner to Soissons, [illegible] empress Judith to Tortona, and confined her [illegible] Charles, afterwards Charles the Bald, the obje[illegible] jealousy of his half-brothers, in a monastery. A [illegible] bishops was held at Compiègne, at which the arch[illegible] Rheims presided, and the unfortunate Louis, being [illegible] before it, was found guilty of the murder of his [illegible] Bernard, and of sundry other offences. Being de[illegible] was compelled to do public penance in sackcloth, [illegible] kept in confinement. In the following year howe[illegible] king of Bavaria, took his father's part, his brother [illegible] Aquitania joined him, and they obliged Lotharius [illegible] to up their father, who was reinstated on the imperi[illegible] Lotharius, after some further resistance, made his s[illegible] and returned to Italy. The emperor Louis now [illegible] to Charles, son of Judith, the kingdom of Ne[illegible] Eastern France, including Paris, and Pepin ha[illegible] soon after, Aquitania was added to Charles's port[illegible] tharius had all Italy, with Provence, Lyon, Suabia, [illegible] and Saxony. But Louis of Bavaria claimed all Ge[illegible] far as the Rhine for himself, and invaded Suabia. [illegible] peror Louis marched against him, and a diet was [illegible] at Worms to judge his rebellious son, but mean[illegible] emperor fell ill, and died in an island of the R[illegible] Mainz, in June, 840, after sending to his son Loth[illegible] imperial crown, his sword, and his sceptre. Loth[illegible] acknowledged as emperor, and after a war ag[illegible] brothers, he retained Italy, Provence, Burgundy, [illegible] and raine. Charles the Bald succeeded his father as [illegible] France, and Louis of Bavaria had all Germany. [illegible] Thus the imperial crown separated from that of Fran[illegible] emperor Louis was a weak prince. It was under [illegible] his re[illegible] that the fiefs were first made transmissible by [illegible] descen[illegible] which hitherto had been held for life only. L[illegible] allowed the popes elect to take possession of their [illegible] charge without waiting for his confirmation. (Hénault, *A[illegible] l'Histoire de France*; Dunham, *History of the G[illegible] Empire.*)

LOUIS II., called 'le Bègue,' or 'the Stammerer,' son of Charles the Bald, succeeded his father on the throne of France in 877. He claimed also the imperial crown against his cousin Carloman, son of Louis the German, but with no success. In France also he was opposed by several great lords, among others by Boson, the brother of his step-mother, Richilda. In order to conciliate them, he followed the example of his father, by parcelling out the domain of the crown into fiefs in favour of his vassals. He died at Compiègne in 879, at the age of 35, leaving three sons, Louis, Carloman, and Charles called 'the Simple.'

LOUIS III. succeeded his father Louis II., together with his brother Carloman. Louis had Neustria, and Carloman Aquitania. Boson founded the kingdom of Arles, which included Provence, Dauphiny, Lyon, Savoy, and Franche Comté. The Normans ravaged the northern coasts of France, where at last they settled. Louis died in 882, and his brother Carloman remained sole king of France.

LOUIS IV., son of Charles the Simple, ascended the throne of France in 936. He sustained several wars against the emperor Otho I. on the subject of Lotharingia or Lorraine, and also against the Normans, whose duke William, son of Rollo, died, leaving an infant son, Richard. Louis's reign was also disturbed by revolts of the great vassals, especially of Hugo, count of Laon, the father of Hugh Capet. Louis died in 954, and was succeeded by his son Lotharius.

LOUIS V., styled 'the Fainéant,' or 'do nothing,' son of Lotharius, succeeded him in 986. He reigned only one year, and died of poison, administered, as it was said, by his wife, the daughter of an Aquitanian lord. With him ended the Carlovingian dynasty, and Hugo Capet took possession of the throne.

LOUIS VI., called 'le Gros,' son of Philip I., succeeded his father on the throne of France in the year 1108. The larger part of the kingdom was then in the hands of the great vassals of the crown, over whom the king's supremacy was but nominal. The king's direct authority extended only over Paris, Orleans, Etampes, Compiègne, Melun, Bourges, and a few more towns, with their respective territories. The duchy of Normandy was in the possession of Henry I. of England, who had taken it from his brother Robert during the preceding reign of Philip I. Henry and Louis quarrelled about the limits of their respective states, and thus began the wars between the English and the French in France, which lasted for more than three centuries. Louis had the worst in several encounters. In 1120 he made peace, but war broke out again, when Henry of England was joined by his son-in-law the emperor Henry V., who entered Champagne, where he was met by Louis at the head of all his vassals, lay and ecclesiastical; even Suger, abbot of St. Denis, was there with the subjects of the abbey. These united forces are said to have amounted to 200,000 men, and the emperor thought it prudent to retire. Louis however could not depend on the same zealous assistance from his vassals in his quarrel with Henry of England as duke of Normandy, because the vassals considered it as their interest not to increase the power of their king. Meantime Henry of England having given one of his daughters in marriage to Conan, son of the duke of Britanny, the latter did homage to Henry for Britanny as a fief of Normandy. (Hénault, *Abrégé de l'Histoire de France.*)

Louis le Gros, assisted by his able minister l'Abbé Suger, succeeded in recovering for the crown some of the power which the great vassals had usurped; he revived the practice of Charlemagne of sending into the provinces commissioners called 'missi dominici,' who watched the judicial proceedings of the great lords in their respective domains, and received appeals and complaints, which they referred to the king for judgment at the great assizes. In most cases however the king had not the power of enforcing his own judgments. But another and a more effective measure of Louis le Gros was the establishment of the communes, for which he deserves to be remembered among the earliest benefactors of the French people. He granted charters to many towns, the inhabitants of which were thereby empowered to choose their local magistrates, and administer the affairs of the community, subject however to the sanction of the king. By this means he began the creation of the third estate, or commons, as a check on the overgrown power of the feudal nobles. A good sketch of the history of the French communes is contained in the 'Exposé des Motifs de la Loi Municipale,' pronounced by M. de Martignac, Minister of the Interior, in the House of Deputies, 9 February, 1829. Louis le Gros died at Paris in 1137, at the age of sixty, and was buried at St. Denis. He was succeeded by his son Louis VII., to whom he gave the following warning on his death-bed: 'Remember, my son, and always bear in mind, that the royal authority is a public charge, of which you must expect to render a strict account after your death.'

LOUIS VII., called 'Le Jeune,' son of Louis le Gros, succeeded his father in 1137. He married Eleanor, daughter and heiress of William, duke of Aquitania, a lady who was handsome and inclined to gallantry. Thibaut, count of Champagne, having revolted against the king, Louis took and burnt his town of Vitry. St. Bernard, abbot of Clairvaux, advised Louis, in order to atone for this cruelty, to go on a crusade; but the Abbé Suger, who was minister of Louis, and had also served the king's father, opposed this project. The zeal of St. Bernard however prevailed, and the king set off with his wife and a large army in 1147. Suger and Raoul, count of Vermandois, Louis's brother-in-law, were left regents of the kingdom. The crusade proved unsuccessful: the Christians were defeated near Damascus, and Louis, after several narrow escapes, returned to France in 1149. His first act after his arrival was to repudiate Eleanor, whose conduct during her residence in the East had been improper; but the bishops, to avoid scandal, dissolved the marriage on the plea that it was not valid because the king and queen were cousins. Suger, who was now dead, had strongly opposed on political grounds the dissolution of the marriage, and the event proved the justness of his foresight, for Eleanor married Henry of England and Normandy, afterwards Henry II., who by this marriage became possessed of Aquitania, Poitou, Maine, and in fact of one-third of France, comprising the whole maritime territory from Dieppe to Bayonne. Louis married Constance of Castile for his second wife. A war now broke out between him and Henry II. of England, which lasted several years, and ended by a peace in 1176, after which Henry as duke of Normandy and peer of France attended the coronation of Louis's son, Philip II., called 'Auguste,' in 1179. Louis died in September, 1180, at Paris, being sixty years of age.

LOUIS VIII., styled 'Cœur de Lion,' succeeded his father Philippe Auguste in 1223. Like his father, he was engaged in wars with the English, from whom he took the Limousin, Perigord, Aunis, and all the rest of the country north of the Garonne. At the request of the pope, he made war against the Albigenses, and laid siege to Avignon, where he died in 1226.

LOUIS IX., called St. Louis, succeeded his father Louis VIII. when he was twelve years of age, under the regency of his mother Blanche of Castile. During the minority of the king, there was a constant struggle between the crown and the great feudatories, at the head of whom were Thibaut, count of Champagne, and the count of Brittany. During this troubled period Queen Blanche displayed much character and considerable abilities. Her son, as soon as he was old enough, putting himself at the head of his faithful vassals, reduced the most refractory lords, and among others the count of Brittany, who came with a rope round his neck to ask pardon of the king, which was granted. Henry III. of England, who supported the rebels, was defeated by Louis near Saintes, upon which a truce of five years was signed between the two kings. During an illness Louis made a vow to visit the Holy Land, and in June, 1248, he set out for the East. He landed in Egypt, and took Damiat, but being defeated at the battle of Mansoura, he was taken prisoner, compelled to pay a heavy ransom, and to restore Damiat to the Mussulmans. From Egypt he sailed to Acre, and carried on the war in Palestine, but with no success, till the year 1254, when he returned to France. The best account of this expedition is by Joinville, who was present, 'Histoire de St. Louis,' edited by Ducange, with notes, folio, 1668. Louis on his return found ample occupation in checking the violence and oppressions of the nobles, whom he treated with wholesome rigour. He published several useful statutes, known by the title of 'Etablissemens de St. Louis;' he established a police at Paris, at the head of which he put a magistrate called prévôt; he classed the various trades into companies called confrairies; he established the college of theology, called La Sorbonne from the name of his confessor; he created a French navy, and made an advantageous treaty with the king of Aragon, by which the respective limits and jurisdictions of the two states were defined. The chief and almost the only fault of Louis, which was that of his age, was his religious intolerance; he issued oppressive ordonnances against the Jews, had a horror of heretics, and used to tell his friend Joinville 'that a layman ought not to dispute with the unbelievers, but strike them with a good sword across the body.' By an ordonnance he remitted to his Christian subjects the third of the debts which they owed to Jews, and this 'for the good of his soul.' (Martennes, *Thesaurus Anecdotorum*, vol. i., p. 980.) This same feeling of fanaticism led him to another crusade, against the advice of his best friends, in which he met his death. He sailed for Africa, laid siege to Tunis, and died in his camp, of the plague, in August, 1270. Pope Boniface VIII. canonized him as a saint in 1297. Louis's brother Charles, count of Anjou and Provence, took the kingdom of Naples from Manfred of Suabia, and established there the dynasty of Anjou. [ANJOU.] (Joinville, Matthew Paris, and the French historians.)

LOUIS X., called 'Hutin,' an old French word meaning 'quarrelsome,' son of Philippe le Bel, succeeded his father in 1314. His uncle Charles de Valois had the principal share of the government during his reign, although the king was of age. Louis imprisoned and put to death his wife Margaret in 1315, on the ground of adultery, and then married Clemence of Hungary. He carried on an unsuccessful war against the count of Flanders, to maintain which he increased the taxes, sold the judicial offices, and obliged the crown serfs to purchase their freedom. Louis died, after a short reign, in 1316, not without suspicions of poison. He was succeeded by his brother Philip V.

LOUIS XI., son of Charles VII., succeeded his father in 1461, being then thirty-nine years of age. He had early exhibited a duplicity of disposition, for which his father mistrusted him. He had revolted against his father in

1456, and being defeated, had taken refuge at the court of Philip, duke of Burgundy, who protected him and maintained him for six years, until his father's death. Louis, when king, became the bitterest enemy of Charles, the son of Philip. The principal events of his reign are connected with those of Charles, and are described under BOURGOGNE. The cautious cunning and consummate hypocrisy of Louis gave him the advantage over the rash courage and headlong passion of Charles, which at last caused his ruin and death at the siege of Nanci, in January, 1477. Louis was successful in depressing the power of the feudal nobles, several of whom he put to death, and in rendering the authority of the crown independent of them. He took into his service a body of Swiss, and kept also ten thousand French infantry, whom he paid out of his own treasury. He carried on a war against Maximilian of Austria, who had married Mary of Burgundy, daughter and heiress of Duke Charles, and took from him Artois and Franche Comté: but at last peace was made between them by the treaty of Arras, in 1482. Louis also made peace with Edward IV. of England. Charles of Anjou, count of Provence, bequeathed that province to Louis XI., as well as his claims to the thrones of Naples and Sicily, a bequest which led to the subsequent attempts of the French to conquer Naples. Louis XI. died in 1483, being sixty years of age. He was a strange compound of daring and superstition, of abilities and weakness, of firmness and perseverance in his political views, joined to an abject meanness of sentiment and habit. The taille, or direct taxation, was tripled under his reign. He was the first who assumed the title of 'Most Christian King,' which was given him by the pope in 1469. The best account of Louis XI. is given by his contemporary and confidant Comines, in his 'Mémoires.'

LOUIS XII., son of Charles, duke of Orleans, descended from a younger son of Charles V., succeeded, in 1498, Charles VIII., who had left no children. He had been obliged by Louis XI. to marry his daughter Joan in 1476, but after his accession to the throne he dissolved the marriage, and married Anne of Britanny, the widow of Charles VIII. Louis asserted his claims to the duchy of Milan, which were derived from his grandmother Valentina Visconti, daughter of John Galeazzo, duke of Milan, and sister of the last duke Filippo Maria, who had died without leaving legitimate children. But Filippo Maria left a natural daughter Bianca, who had married the famous condottiere Francesco Sforza, who succeeded his father-in-law as duke of Milan, and the Sforza family had been confirmed in the possession of the duchy by the emperor, Milan being considered as a fief of the empire. Francesco was succeeded by his son Galeazzo, who, being murdered in 1475, left an infant son Gian Galeazzo, whose uncle Ludovico assumed the government during his minority. After the death of Gian Galeazzo in 1494, Ludovico, who was suspected of having poisoned his nephew, was proclaimed Duke, and confirmed by a diploma of the emperor Maximilian I. Louis however marched with an army into Italy and took possession of the duchy of Milan in 1499. In the following year he made Ludovico Sforza prisoner, and carried him to France, where he died in confinement. Emboldened by this success, Louis now put forward the claims of the crown of France to the possession of Naples derived from the Anjous. [LOUIS XI.] These claims had already been asserted by his predecessor Charles VIII., who however, after invading Naples, was obliged to give up his conquest. The Aragonese dynasty had resumed possession of that kingdom; and Frederic of Aragon, who was king of Naples, feeling that he was too weak to resist Lous XII., applied for assistance to his relative Ferdinand the Catholic, king of Spain, who sent him an army under the celebrated commander Gonzalo of Cordova. Louis had recourse to secret negotiations; he proposed to Ferdinand of Spain to dethrone his relative and protegé, and to divide the kingdom of Naples between them. Such a proposal was exactly suited to the character of Ferdinand, and he assented to it. Whilst Louis marched against Naples, Gonzalo, in consequence of secret orders from his master, was occupying in his name the towns of Calabria and Puglia; and a third worthy partner in such a transaction, Pope Alexander VI., gave to Louis the solemn investiture of the crown of Naples, which he had a few years before bestowed upon the unfortunate Frederic. The latter, perceiving the perfidiousness of his Spanish relative, surrendered himself to Louis, who gave him the duchy of Anjou and a pension for life. Louis and Ferdinand soon quarrelled about their respective shares of the spoil, and Ferdinand gave orders to Gonzalo to drive away the French from Naples. The two battles of Seminara and Cerignola, both fought in April, 1503, in which the French were defeated by the Spaniards, decided the fate of the kingdom of Naples, which became entirely subject to Spain. A few years after Pope Julius II. formed a league with Ferdinand and the Swiss to drive the French out of Italy altogether; and after three campaigns, Gaston de Foix, duke of Nemours, being killed at the battle of Ravenna, the French abandoned Lombardy; and Maximilian Sforza, son of Ludovico, supported by the Swiss, assumed the ducal crown of Milan in 1512. Louis sent a fresh army into Italy under La Trimouille, who was beaten at Novara by the Swiss, in June, 1513; and thus, after fifteen years of fighting, intrigues, and negotiations, the French lost all their conquests in Italy. Louis XII. has been styled by courtly historians 'the father of his people;' he was, in fact, kind-hearted towards his subjects, and he reduced the taxes by one-half; but his foreign policy was unjust and imprudent. In order to forward his ambitious purposes he allied himself to the atrocious Borgias and the unprincipled Ferdinand; and the calamities which his troops inflicted upon Italy, the horrors of the storming of Brescia, the cruel execution of Count Avogadro and his two sons because they resisted the invaders, and other atrocities committed by the French commanders, are great stains on the memory of this 'paternal' monarch. Having lost his best troops, he reluctantly gave up his Italian schemes, made peace with Ferdinand and the pope, and, at the age of fifty-three, married Mary, sister of Henry VIII. of England. His young wife made him forget his years and the weakness of his constitution: 'on her account,' says the biographer of Bayard, 'he changed all his mode of life; instead of dining at eight o'clock in the morning, or before, he fixed his dinner-hour at noon; and instead of going to bed at six in the evening, as heretofore, he often sat up till midnight.' He did not live quite three months after his marriage, and died at Paris, in January, 1515, leaving no male issue. He was succeeded by Francis I.

LOUIS XIII., son of Henri IV. and of Mary de' Medici, succeeded his father in 1610, being only nine years age, under the regency of his mother. In October, 1614, he was declared to be of age, and in the following year he married Anne, daughter of Philip III. of Spain. Concino Concini, maréchal d'Ancre, a Florentine, the favourite minister of the queen-dowager, had, by his insolence and his intrigues, excited the jealousy of many of the high nobility, with the prince of Condé at their head, who left the court and began a civil war. Louis XIII., who was impatient of the rule of his mother, and of the favourite, but had not spirit enough to shake it off, consulted with a young courtier called Luines, and by his advice ordered Vitri, an officer of his body-guard, to arrest the marshal. Vitri stopped him on the drawbridge of the Louvre; the marshal attempted to defend himself, upon which Vitri killed him. The people of Paris made great rejoicings at his death, dragged his body through the streets, cut it to pieces, and threw it into the river. The parliament of Paris declared him to have been guilty of treason and sorcery, and on the same grounds sentenced his wife, who was also a Florentine, named Galigai, to be beheaded, and her body burned, a sentence which was executed on the 8th July, 1617. This trial and sentence are amongst the most disgraceful of the old French judicature. The queen-dowager was sent to Blois under arrest. Luines now became the ruling favourite; for Louis was totally incapable of governing himself during the whole of his life. Some years after the queen-dowager escaped from Blois, and being supported by several nobles, the civil war broke out again; but Armand du Plessis, bishop of Luçon, known afterwards as Cardinal de Richelieu, acted as mediator between the king and his mother, in consequence of which he obtained a cardinal's hat, and in 1624 became minister, and lastly prime-minister, which he continued to be till his death in 1642. Richelieu was certainly one of the greatest ministers of France under the old monarchy; fertile in resources, firm, sagacious, and unscrupulous, he succeeded in humbling and weakening the feudal nobility, and thus paved the way for the absolute government of Louis XIV. He checked the ambition of the house of Austria by assisting, first secretly and afterwards openly, the German Protestant states and the Swedes, by which means France acquired a considerable influence in the affairs of the Empire. In 1628 Richelieu took La Rochelle, the great stronghold of the Protestants of France, which had often withstood the kingly forces under the former reigns. The French armies took an important part in the thirty years' war; they acted on the Rhine in concert with the Swedes, whilst another French army carried on the war in Italy against the Spaniards, a third army was fighting in Flanders, and a fourth on the frontiers of Catalonia. The French were generally successful: they took Roussillon, Alsace, the duchy of Bar, and other provinces. In December, 1642, Richelieu died at Paris, being 58 years of age. His great object had been, during all his ministry, to render the government of the king absolute, and he succeeded. Richelieu at the same time patronized learning and the fine arts; he established the royal press; he embellished Paris; he was magnificent and high-minded: his ambition was not a selfish or a vulgar one. Among his agents and confidants there was a Capuchin, called Father Joseph, whom he employed in the most secret and important affairs, and who seems to have equalled his master in abilities.

Louis survived his minister only a few months; he died in May, 1643, leaving his son Louis XIV. a minor, under the regency of the queen-mother.

(Hénault, *Abrégé de l'Histoire de France*; *Vie du véritable Père Joseph*; Coxe and the other historians of the Thirty Years' War.)

LOUIS XIV. succeeded his father in 1643, being then hardly five years old. His reign, including his minority, lasted seventy-two years, a long and important period, marked by many events and vicissitudes all over Europe, in most of which Louis took an active part. The history of such a reign requires volumes, and has been written or adverted to and commented upon by numerous historians who have treated of that age. But the best works for making us acquainted with the character of Louis and of his government, and the condition of France under his reign, are the contemporary memoirs of St. Simon, Dangeau, Louville, Noailles, Cardinal de Retz, Madame de Motteville, and others, and above all the writings of Louis XIV. himself, especially his *Instructions pour le Dauphin*, which reveal his most secret thoughts. Cardinal Mazarin, an Italian by birth and a pupil of Richelieu, but inferior to his master, was the minister of the regency during the minority of Louis. He continued the war against Spain and the emperor of Germany in conjunction with the Swedes. Turenne, the marshal of Grammont, and the duke of Enghien, afterwards the great Condé, distinguished themselves in those wars. The treaties of Münster and Osnabruck (1648) put an end to the thirty years' war, and Mazarin had the satisfaction of concluding this peace, called that of Westphalia, by which France acquired Alsace, the Suntgau, and the seigniory of the bishoprics of Metz, Toul, and Verdun. The same year however that the war in Germany was terminated the civil war of La Fronde broke out in France. [FRONDE, LA.] The parliament of Paris and several of the high nobility revolted against the authority of the cardinal. Louis, then ten years of age, the queen regent, and Mazarin, were obliged to leave the capital in January, 1649, and this humiliation seems to have made a deep impression on the mind of Louis, and to have contributed to render him mistrustful, arbitrary, and stern. After some fighting, peace was made, and the court re-entered Paris in the month of August. This was the same year in which Charles I. was beheaded in England and the monarchy abolished. The prince of Condé, who had been the means of appeasing the civil war, having given offence to the queen and the cardinal, was arrested, and Turenne and other Frondeurs began again the civil war in the following year (1650). [CONDÉ, LOUIS DE.] In 1651 the queen ordered the release of Condé; Turenne made his peace with the court, and Mazarin was exiled by a sentence of the parliament of Paris. Condé however continued the war, and being joined by the duke of Orleans, took possession of Paris, which the court had left again. In October, 1652, an arrangement took place, the king re-entered Paris, Condé emigrated to join the Spaniards, the cardinal de Retz, one of the chief actors in the disturbances, was put in prison at Vincennes, and Mazarin himself returned to Paris in February, 1653, and resumed the ministry. In 1654 Louis XIV. made his first campaign in Flanders against the Spaniards. In the following year he concluded a treaty of alliance with Cromwell against Spain. The war continued that and the next year with various success; Turenne commanded the French troops, and the prince of Condé fought on the side of the Spaniards against his own country.

In 1567 the emperor Ferdinand III. died, and Mazarin intrigued to prevent the election of his son Leopold, and to obtain the imperial dignity for Louis XIV. He began by supporting, through his agents at the Diet, the pretensions of the elector of Bavaria, and representing and exaggerating the danger to the liberties of Germany which would attend another election of an Austrian prince to the imperial throne. It was soon found however that the elector of Bavaria was not likely to be nominated, and Mazarin then intrigued separately with the electors in favour of Louis. He bribed, by actual disbursements of money and ample promises of territorial aggrandisement, the archbishops electors of Treves and Cologne, as well as the elector-palatine, and even the elector of Brandenburg. Had he succeeded in gaining over the elector of Mayence, John Philip de Schœnborn, chancellor of the empire, Louis XIV. would have succeeded. Louis himself repaired to Metz, his army being cantoned in that neighbourhood, as if to support his pretensions. The cardinal sent to the Diet at Frankfort the marshal of Grammont and M. de Lyonne to further his object. In his instructions he empowered them to offer to the elector of Mayence 300,000 livres, besides a revenue of 90,000 more for his relations, and, if necessary, to send at once to Frankfort the value of 1,200,000 livres in plate and other valuable objects as a security. (*Instructions adressées de Stenay, le 29 Juillet, 1657, par Mazarin, à Messrs. de Grammont et de Lyonne*, quoted by Lemontey among the *Pièces Justificatives* of his *Essai sur l'Etablissement Monarchique de Louis XIV.*) The elector of Mayence however adjourned the election to the following year, and wrote to Leopold of Austria, king of Hungary and Bohemia, son of Ferdinand, promising him his vote. The other electors kept the money they had received from Mazarin, and turned also in favour of Leopold, who was unanimously elected in 1658. From that time began the bitter animosity of Louis against Leopold, which lasted half a century, and was the cause of three long and bloody wars.

Meantime the war with Spain was brought to a close in November, 1659, by cardinal Mazarin, by the treaty of the Bidasoa, in which the marriage between the Infanta Maria Theresa, daughter of Philip IV. of Spain, and Louis XIV., was concluded. Spain gave up the Artois and Roussillon, and stipulated for a free pardon to the Prince of Condé.

The new queen was married and made her entrance into Paris the following year (1660). She brought with her half a million of crowns as a dowry. She was extremely weak in her intellect and childish in her habits, but harmless and good-natured. Louis XIV. always behaved to her with considerate regard, but never felt any affection towards her, and he resorted to the society of a succession of mistresses, of whom Mademoiselle de la Vallière, Madame de Montespan, and Madame de Maintenon are the most known.

In February, 1661, Mazarin concluded at Vincennes a third and last treaty with Charles, duke of Lorraine, by which Strasburg, Phalsburg, Stenai, and other places were given up to France. Nine days after this treaty Mazarin expired, at fifty-nine years of age, leaving a large fortune to his nieces Mancini, and to his nephew, whom he made duke of Nevers. Mazarin was more successful at the close of his career, in his treaties of peace, than he had been in his wars and former negotiations. The following satirical epitaph, published at the time, expresses the common feeling in that respect:—

'Enfin le cardinal a terminé son sort;
Français! que dirons nous de ce grand personnage?
Il a fait la paix, il est mort;
Il ne pouvoit pour nous rien faire davantage.'

With the death of Cardinal Mazarin began the real emancipation of Louis XIV., who from that moment took the reins of the government entirely into his hands. He dismissed and imprisoned Fouquet, the superintendent or minister of finance, and had him tried on the charges of peculation and treason by an extraordinary commission, which condemned him to banishment; but Louis aggravated the sentence by shutting him up in the castle of Pignerol, in the Alps, where he died in 1680. In appointi Colbert in the room of Fouquet, Louis made a good cho and much of the splendour of his reign is due to that able minister. [COLBERT, JEAN BAPTISTE.] The ruling principle of Louis XIV. was pure absolutism. The king, according to him, represented the whole nation; all power, all authority, were vested in him. 'L'état, c'est moi!' was his well-known expression. This form of government, he said, was the best suited to the character of the nation, its habits, its tastes, its situation. In his written instructions to the dauphin he tells him that 'all which is found in the extent of our dominions, of whatever nature it be, belongs to us. The monies in our treasury, as well as those which are in charge of the receivers and treasurers, and those which we leave in the hands of our subjects for the purposes of trade, are all alike under our care. You must be convinced that kings are absolute lords, and have the full and entire disposal of all property, whether in the possession of the clergy or of laymen, and may use it at all times as wise economists. Likewise the lives of their subjects are their own property, and they ought to be careful and sparing of them.... He who has given kings to men has ordered them to be respected as his lieutenants, reserving to himself alone the right of examining their conduct. It is his will that whoever is born a subject should obey without discrimination or reservation.... The essential defect of the monarchy of England is that the prince cannot raise men or money without the parliament, nor keep the parliament assembled without lessening thereby his own authority.' (*Œuvres de Louis XIV.*, vol. ii., Paris, 1816.)

Louis XIV. completed the work begun by Richelieu: he changed France from a feudal monarchy into an absolute one. Ximenes, Charles V., and Philip II. had effected the same change in Spain; but they had the clergy and the Inquisition to support and share their power, and the absolutism of Spain stood longer than that of France. Louis enticed the high nobility from their rural mansions, attracted them to court, employed them about his person, gave them pensions or placed them in his regular army, and completely broke down their former spirit of independence. With regard to the church, he distributed its temporalities to his favourites, both clerical and lay, bestowed livings and pensions and abbacies in commendam on courtly abbés, and thus rendered the clergy docile and subservient to the crown. He had several disputes with the court of Rome, in which he treated the pope with great asperity; twice he braved the pontiff, through his ambassador, in the middle of Rome [ALEXANDER VII.; INNOCENT XI.]; twice he seized upon Avignon, and twice he obliged the papal court to make him humble apologies. In his old age he became very devout, intolerant, and superstitious, and yet he mistrusted the papal court: 'You know,' he wrote to his ambassador, 'that the court of Rome always seeks for opportunities and pretences to extend its authority; that whatever concession it obtains from other states through the necessities of the times and political expediency it afterwards considers as its own right; and that when at last a king takes up the defence of his own prerogatives, he finds himself involved in much more serious disputes than if he had stood out against encroachment at first.' (*Lettre du Roi au Cardinal d'Estrées, 27 Mai*, 1703.)

After the death of Mazarin, Louis admitted no more ecclesiastics into his council. The spirit of jealousy of the Gallican church made it less dependent on Rome and more subservient to the crown; and the hostility of the magistracy against the clergy furnished the king with an arm always ready to check any mutinous disposition in the clerical body. Louis XIV. made the throne support the church, but did not look to the church for a support to the throne. He endeavoured to stop the increase of monks and monasteries, whom he describes, in his 'Instructions pour le Dauphin,' as 'useless to the church and burthensome to the state.'

The parliaments were also subdued, like the nobility and clergy, by the absolute will of Louis. When only seventeen years of age, in 1655, the parliament of Paris having made some remonstrances against an edict of the king concerning the coinage, he rode from Vincennes to Paris, entered the hall of the parliament, booted as he was, holding his whip in his hand, and, addressing the first president, told him that the meetings of that body had produced calamities enough, and that he ordered them to cease discussing his edicts. 'And you, Mr. President,' said he, 'I forbid you to allow it.'

In 1657 Louis issued an edict forbidding the parliament of Paris from making any remonstrances concerning the royal edicts before registering them, and not until eight days after it had obediently registered them, after which the parliament might address him written remonstrances. From that time and to the end of his reign the parliament offered little or no impediment to the royal authority; it withdrew itself from state affairs, and confined itself to its judicial functions.

Having destroyed all opposition from the only orders which enjoyed any consideration in the state, Louis took care to make it known to the tiers état, or commons, that it was not for its advantage that he had humbled the privileged classes. In fact, he did not consider the tiers état as forming a class, but as an ignoble crowd of roturiers who were doomed to work for him and to obey his mandates, and from amongst whom he deigned from time to time to select some individuals as objects of his favour. In his celebrated edict of 1679, concerning duels, he speaks with the most insulting contempt of all persons 'of ignoble birth' who are 'insolent enough' to call out gentlemen to fight; and in case of death or serious wounds resulting therefrom, he sentences them to be strangled and their goods confiscated, and awards the same penalties to those gentlemen who shall presume to fight against 'unworthy persons and for abject causes.' This law, most offensive to the great mass of the French people, was confirmed after Louis's death by the edict of February, 1723, and continued in vigour till the fall of the old monarchy.

Louis established that system of centralization in the administration which has been followed and rendered more complete by the various governments that have succeeded each other till our own days, and which renders France the most compact power in Europe, and in which the action of the executive residing at Paris is felt at every step by every individual in the most remote corners of the kingdom. He at the same time began the first labours for a regular system of legislation, by issuing separate ordonnances for civil and criminal process, for commercial matters, for the woods and forests, and for the marine, and which with all their imperfections formed the basis of distinct codes. The education of Louis had been very imperfect, and he was himself in great measure uninformed; but he encouraged science and literature, for which he was rewarded by numerous flatteries. His reign was a brilliant epoch of learning in France. With regard to the arts, he had more pomp than taste; he felt a pride in conquering obstacles, as the millions he lavished on Versailles, in a most unfavourable locality, amply testify.

Louis XIV. hated the Protestants, not so much from religious bigotry as because he considered them as rebellious subjects; he wanted uniformity in everything, in religion as well as politics. This led him to that most unjust and disastrous measure, the revocation of the edict of Nantes, in 1685, by which Protestantism was proscribed in France. France lost thousands of its most industrious citizens, who repaired to England, Switzerland, Holland and Germany, carrying with them their manufacturing skill, and all the efforts of Colbert to encourage French industry were rendered abortive by that cruel and fanatical act, of which the revolt of the Cévennes and the war of extermination which followed were remote consequences. The persecution of the Jansenists was another consequence of Louis's intolerance.

The foreign wars of Louis XIV. proceeded in great measure from the same ruling principles or prejudices of his mind. He disliked the Dutch, whom he considered as mercantile plebeians, heretics, and republicans, 'a body formed of too many heads, which cannot be warmed by the fire of noble passions' (*Instructions pour le Dauphin*, vol. ii., p. 201); and he carried his antipathy to the grave, without having succeeded in subjecting that small nation, whose wealth excited enemies against him everywhere. It is impossible not to be struck with the similarity of prejudices in two men, however dissimilar in some respects, Napoleon and Louis XIV. The hatred of Napoleon against England, which he designated as a nation of shop-keepers, was like that of Louis against the Dutch, and it produced similar results to his empire. The same determination of establishing uniformity in everything; the same mania for a unity and singleness of power, which both mistook for strength; the same ambition of making France the ruling nation of Europe under an absolute ruler, were alike the dominant principles, or rather passions, of the 'legitimate and most Christian king,' and of the plebeian 'child and champion of the Revolution.' Several of the plans and schemes of Louis XIV., relative to foreign conquests, were found in the archives, and were revived and acted upon by Bonaparte.

The first war of Louis XIV. against the emperor Leopold, Holland, and Spain, was ended by the treaty of Nymegen, 1678. Louis kept the Franche Comté and part of the Spanish Netherlands. The war broke out again in 1689, between Louis on one side, and the Empire, Holland, and England on the other. Louis undertook to support James II. in Ireland, but the battle of the Boyne and the capitulation of Limerick put an end to the hopes of the Stuarts, and James II. passed the rest of his life in exile at St. Germain-en-Laye, where he died a pensioner of the French king. In Germany Louis XIV. caused one of the most atrocious acts recorded in the history of modern warfare. This was no less than the devastation of the Palatinate by his commanders, A district of more than thirty English miles in length, with the towns of Heidelberg, Manheim, Speyer, Oppenheim, Crutzenach, Frankenthal, Ingelheim, Bacharach, Sinzheim, and others, was ravaged, plundered, and burnt, in cold blood, under the pretence of forming a barrier between the French army and its enemies. A cry of indignation resounded throughout all Europe at the disastrous news. It was just about this time that James Stuart solicited, from his exile at St. Germain, the assistance of the emperor against William of Orange, in the name of legitimacy and the Catholic religion. Leopold in his answer observed, 'that there are no people who injure so much the cause of religion as the French themselves, who on one side support the Turks, the enemies of all Christendom, to the detriment of the Empire; and on the other, have ravaged and burnt innocent towns, which had surrendered by capitulations signed by the hand of the Dauphin: they have burnt the palaces of princes, plundered the churches, carried away the inhabitants as slaves, and treated Catholics with a cruelty of which the Turks themselves would be ashamed.' (*Letter from the Emperor Leopold to James II.*, 9th April, 1689, in the *Mémoires de Jacques II.*, vol. iv.) In 1693 the unfortunate town of Heidelberg, which had been partly restored by the inhabitants, was taken again by the French marshal De Lorges, the women were violated, the churches set on fire, and the inhabitants in general, 15,000 in number, stripped of every thing and driven away from their homes. On these news a 'Te Deum' was sung at Paris, and a coin struck, which represented the town in flames, with the inscription, 'Rex dixit et factum est!' The treaty of Ryswick, in 1697, terminated the war, by which Louis gained nothing, acknowledged William III. as king of Great Britain, and restored the duke of Lorraine to his dominions.

The third war of Louis was that of the Spanish succession. It began in 1701 and lasted 13 years, convulsed all Europe, and was terminated at last by the peace of Utrecht in 1713. Louis succeeded in establishing a Bourbon dynasty in Spain, but this was the only advantage he gained; his armies had been repeatedly defeated by Eugene and Marlborough, his best generals were dead, his treasury was exhausted, his subjects were tired of war and of taxes, and he himself was broken down in health and spirits, a mere shadow of what he had been. He lingered about two years more, during which he legitimated his numerous natural children; made his will, by which he appointed his nephew, Philip Duke of Orleans, regent during the minority of his great-grandson and heir Louis XV.; fell ill in August, 1715, and died the 1st of the following September, 77 years of age.

After divesting the character of Louis XIV. of the exaggerated praise bestowed on him by flattery or national vanity, after animadverting upon his numerous faults, and even crimes, it must be fairly acknowledged that he was a remarkable prince, and had many valuable qualities. He was active, intelligent, and regular in business; quick in discovering the abilities of others, an able administrator himself, endowed with a constant equanimity in adversity as well as prosperity, and a perfect self-command: a kind master, he was not prone to change his servants capriciously, was not harsh in rebuking them, and was ever ready to encourage merit, and praise and reward zeal for his service. Hence he had many faithful and devoted servants. His manner was noble, and his appearance imposing; he acted the king, but he acted it admirably, at least to the then taste of the people; he had a lively sense of decorum and outward propriety, which never forsook him. What he knew he learnt by himself: his natural gifts and the experience of his youth, passed among civil wars, made up for his want of learning and of study. If he carried his notions of absolutism to an extreme, he was evidently persuaded of his supposed right, and acted as much from a sense of duty as from inclination. In his reign of seventy-two years he reared the fabric of the absolute monarchy in France, which continued for seventy-two years more after his death; and when it was shaken to pieces in the storms of the Revolution, still the ruling principles of his administration, uniformity and centralization, survived the wreck, and France is still governed by them.

Louis XIV. raised the revenue of France to 750 millions of livres, or about 30 millions sterling, an enormous sum considering the then poverty of the country. The taille, or direct tax, was very unequally assessed. The evils of the system of taxation under his reign are exhibited in a book, printed in 1694, called 'A Compendious History of the Taxes in France.' Louis spent 3865 millons of livres for his two last wars, that which ended by the peace of Ryswick, and the war of the Spanish succession, and he left at his death a debt of more than two thousand millions. He set up the fatal example of those enormous permanent armies which the other powers of Europe were obliged to imitate in their own defence, and thus gave that mistaken impulse towards making France a nation of soldiers, which has been the occasion of much mischief ever since. (*Mémoires Complets et Authentiques du Duc de St. Simon sur le Siècle de Louis XIV.*, 21 vols. 8vo., Paris, 1829-30; Lemontery, *Essai sur l'Etablissement monarchique de Louis XIV., et sur les Altérations qu'il eprouva pendant la Vie de ce Prince*, forming the 5th vol. of the 'Œuvres de P. E. Lemontey,' Paris, 1829; Hénault, *Abrégé Chronologique de l'Histoire de France;* Voltaire, *Siècle de Louis XIV.;* and the other French historians.)

LOUIS XV., born in February, 1710, was the only surviving son of the duke de Bourgogne, eldest son of Louis the Dauphin, son of Louis XIV. The Dauphin died in 1711, and his son the duke of Bourgogne died in 1712. The younger brother of the duke of Bourgogne was Philip, duke of Anjou, afterwards Philip V. of Spain, who, except his nephew Louis XV., was the only legitimate descendant of Louis XIV. who survived that king. The mother of Louis XV. was Maria Adelaide of Savoy, who died in 1712. Philippe d'Orléans, son of Philippe de France, brother of Louis XIV., and the head of the actual Orléans branch of the Bourbons, was appointed regent. Louis XIV. had by his will appointed a council of regency, at the head of which was the duke of Orleans, but the parliament of Paris acknowledged the duke as sole regent. In gratitude the Regent issued, on the 15th September, a declaration, in the name of the king, restoring to the parliament the right of making remonstrances on the royal edicts, letters patent, and declarations, before it registered them.

The duke of Orleans had acquired an unfavourable reputation as a man of licentious habits, and as destitute of religious and moral principles. This corruption was partly ascribed to the Abbé Dubois, an unprincipled man, who had been his preceptor, continued to be his favourite, and was afterwards his minister. Vicious as the duke was, he was accused of crimes of which he was guiltless. The sudden death of the children and grandchildren of Louis XIV., at short intervals from each other, had given rise to horrible suspicions, which have been since generally rejected. The 'Mémoires de St. Simon,' already quoted, which include the period of the regency, contain the most correct sketch of the character of the duke of Orleans, a character not rightly understood till the publication of that work.

The Regent began well: he reformed several of the most outrageous abuses of the late reign, he liberated a number of individuals who had been for years immured in the Bastille; he enforced economy, reduced the army, supported the general peace of Europe, courted the friendship of England, concluded the triple alliance of the Hague in 1717, between France, England, and Holland, and gave up altogether the cause of the Pretender. Unfortunately for him and for France, the disorder in which he found the finances, and the fearful deficiency in the revenue, made him listen to the wild schemes of Law, which ended in disappointment and the ruin of thousands of families. [LAW, JOHN.]

Philip V. of Spain, or rather his minister Alberoni, ha encouraged a conspiracy against the duke of Orleans, the object of which was to excite a revolution against him, to deprive him of the regency by a resolution of the three estates of the kingdom, and to place Philip himself at the head of the regency. The plot was discovered, several of the leaders, who were chiefly in Britanny, were punished by death, and in 1719 the Regent declared war against Spain. The war however did not last long, Alberoni was dismissed and banished by his sovereign, and Philip of Spain made peace with France in 1720. [Alberoni.] In 1722 Dubois, who had been made a cardinal, became prime minister of France.

In February, 1723, Louis XV., having completed his fourteenth year, was declared of age, and the regency of the duke of Orleans terminated. The same year Dubois died, and was followed to the grave by the duke of Orleans a few months after. The duke de Bourbon Condé was made prime minister, and governed France until 1726. It was proposed to marry Louis XV. to Mademoiselle de Sens, the duke's sister, who was a rare instance of virtue, beauty, and modesty united, in those times, but she refused, and preferred a life of retirement to a throne. Louis married, in 1725, Maria Leczinska, daughter of Stanislaus, ex-king of Poland, and in the following year the duke of Bourbon was dismissed from the ministry, and the Abbé de Fleury, the king's preceptor, and afterwards cardinal, was substituted for him. The seventeen years of Fleury's administration, which ended with his death in 1743, were the best period of the reign of Louis. [Fleury, Andre Hercules.] Fleury restored order in the finances, and credit and commerce revived. In 1733 the war of the Polish succession broke out, by the death of king Augustus II., when Louis XV. took the part of his father-in-law Stanislaus, the old rival of Augustus, against Austria and Russia, who supported the son of Augustus. [Augustus III.]

The war was carried on between France and Austria both on the Rhine and in Italy. In the latter country the French, being joined by the Spaniards and the king of Sardinia, obtained great success. Don Carlos, son of Philip V., conquered the kingdom of Naples and Sicily, and thus a third Bourbon dynasty was founded in Europe. Peace was made in 1736, by which the duchy of Lorraine was given to Stanislaus for his life, to be united after his death to the crown of France. Francis, duke of Lorraine, had Tuscany in exchange. In 1741 the war of the Austrian successor broke out, in which France took part, against the advice of Fleury, who was overruled by the king and the courtiers. In 1743 Fleury died, and Louis declared that he would govern by himself, and without any prime minister. The war continued till 1748, when it was terminated by the treaty of Aix-la-Chapelle. France derived no advantage from this murderous and expensive war, and Maria Theresa remained in possession of her father's dominions. Louis XV. was present at the battle of Fontenoi, in May, 1745, between the English, commanded by the Duke of Cumberland, and the French, commanded by Marshal de Saxe, in which both armies fought with the greatest obstinacy and suffered most severely; the French however claimed the victory.

In 1755 hostilities were begun by the English against the French in America, in consequence of disputes concerning the boundary-line between Canada and the English settlements. In the following year war was formally declared between the two powers. This war connected itself with the war in Europe called the Seven Years' War. The English were the allies of Frederick of Prussia, whilst the French joined the empress Maria Theresa. This war proved most unfortunate to France. The French were beaten at Rosbach by Frederick, in 1757, and were defeated again at Minden by the Duke Ferdinand of Brunswick, with the loss of 8000 men, cannon, baggage, military chest, &c. In America they lost Canada. A project of invasion of England by means of six thousand flat-bottomed boats, by which landings were to be effected on various points of the coast was revealed to the English ministry by an Irishman called Macallister, and was abandoned. At last by the peace of Paris, February, 1763, France formally ceded Canada, Nova Scotia, and its other North American colonies, besides Granada, Dominica, and Tobago in the West Indies; its navy never after recovered from its losses, its finances were exhausted, and its commerce destroyed. This was the last war of Louis XV., a war which was undertaken rashly and terminated in a disastrous and humiliating manner. The feeling of disgrace resulting from it sunk deeply into the heart of a people so vain and sensitive as the French, and it completely did away with the former popularity of Louis, which had once obtained him the title of 'Bienaimé,' or beloved. The king had now abandoned himself to gross licentiousness, and had become careless of state affairs. The mad attempt of Damiens made him still more alienated from his people. [Damiens.] After the death of his mistress, the Marchioness of Pompadour, an ambitious intriguing woman, but who had still some elevation of mind, he became attached to more vulgar women [Barry, Marie Jeanne], and at last formed a regular harem after the fashion of the Eastern sultans, but more odious from its contrast with European manners, which was called the Parc aux Cerfs, and upon which vast sums were squandered. The minister of foreign affairs, Choiseul, who had remonstrated with the king upon his degradation, was dismissed in 1770. He was the last man of some merit who served Louis XV. [Choiseul, Etienne François, Duc de.] The state of the finances was the most obvious difficulty of ministers, to whose remonstrances, urged sometimes in a tone of appalling and ominous seriousness, Louis used to answer, 'Try to make things go on as long as I am to live; after my death it will be as it may.'

Louis died at Versailles, on the 10th May, 1774, 64 years of age. Two sons whom he had had by his wife were both dead: the eldest, the Dauphin, died in 1765, and left by his wife, a Saxon princess, three sons, who have been in succession kings of France, namely, Louis XVI., Louis XVIII., and Charles X. Louis XV. had also by his wife several daughters, besides illegitimate children.

It was under Louis XV. that the corruption of morals and principles spread in France to an alarming extent among all classes, being encouraged by the materialism and sensual philosophy which were taught by several men of letters. Both these causes, added to the general poverty, national humiliation, and ruined finances, prepared the way for the explosion which took place under his unfortunate successor. (Lacretelle; Fantin des Odoards; Voltaire, *Vie Privée de Louis XV.*)

LOUIS XVI., grandson of Louis XV., succeeded him in 1774, being then twenty years of age. He had married in 1770 Marie Antoinette, archduchess of Austria, sister of Joseph II. He chose for his minister of finance Turgot, an honest and enlightened man, who, in concert with his colleague Malesherbes, perceiving the temper of the times, wished the king to take the reform into his own hands, by abolishing the corvées and other feudal exactions, equalizing the direct taxes all over the kingdom, granting liberty of conscience and recalling the Protestants, reforming the criminal code, compiling a uniform civil code, giving freedom of trade, rendering the civil power independent of all ecclesiastical jurisdiction, suppressing the greater part of the convents, and establishing a new system of public instruction. These were the real wants of France; if they could have been satisfied, the revolution would have become unnecessary. But the clergy and the nobility strongly opposed these projects, the parliaments themselves were averse to changes which would reduce their own importance, and the old count de Maurepas, who was also one of the cabinet, dissuaded the young king from them. Turgot was dismissed. Louis however, following his own natural disposition, effected much partial good; he abolished the corvées and the practice of torture, granted liberty of trade in corn in the interior of the kingdom between one province and another, made many reforms in the administration, established a system of economy and order, and gave the first example of it himself in his own household. He also granted toleration to the Protestants. But all these were little more than palliatives, and did not strike at the root of existing evils. The deficiency in the treasury, and the debt of four thousand millions of livres left by Louis XV., were the great stumbling-block of Louis's administration. He however went on for some years, during which he engaged in a war against England, which was very popular with the French, humbled as they had been in the preceding struggle with that power. The object of this war was a singular one for an absolute monarchy to embark in; it was in support of the revolted colonies of North America, which had declared their independence of Great Britain, and it has been since considered by many as a political blunder on the part of the French monarch. On the 6th February, 1778, a treaty of commerce and alliance was signed at Paris between the French cabinet and Franklin and Silas Deane on behalf of the United States, by which the latter were acknowledged by France as an independent community. In the following May a French fleet under count d'Estaing sailed for America, in June the first hostilities took place at sea, and on the 10th July France declared war against England, and 40,000 men were assembled in Normandy for the invasion of England. This plan however was not carried into effect, because the French and Spanish fleets, which were to protect the landing, were dispersed by contrary winds. In America the French auxiliary troops, joined to the Americans, were successful against the English. [Fayette, La.] At sea many engagements took place between the French and English, both in the Atlantic and the Indian seas, without any very decisive advantage on either side; but on the 12th April, 1782, the French Admiral De Grasse was completely defeated by Admiral Rodney off the island of Dominica, with the loss of five ships of the line, and was taken prisoner. In September of the same year the attack of the French and Spaniards upon Gibraltar failed. [Arçon.] In September, 1783, peace was concluded at Versailles; England acknowledged the independence of the United States, and gave up to France Tobago and the coast of Senegal.

Meantime the financial embarrassment of the French government went on increasing. Necker, a Genevese banker, wealthy and retired from business, having become minister of finance in 1776, made many reforms, effected a new and more equitable assessment of the direct taxes, established provincial assemblies of notables, who apportioned the taxes, and put an end to the enormous gains of the fermiers-généraux. [Farmers-General.] After five years of war his 'compte rendu' showed a surplus of ten millions of livres; he had borrowed 530 millions at a less interest than had ever been known in times of war; the discount on exchequer-bills, which had been sixteen per cent., was reduced to eight, and all this without any addition to the burthens of the people.

In November, 1783, by a court cabal Necker was dismissed, and Calonne, a more pliant and courtly person, was substituted. He managed to go on a little longer, involved himself in a dispute with the parliament of Paris, and at last, being unable to proceed any further, he proposed to the king to call together an assembly of the notables selected by the king from the various provinces, to consult upon the means of supplying the deficiency in the revenue, which Calonne stated to amount to 110 millions of livres. This assembly met at Versailles in February, 1787, rejected Calonne's proposal of laying additional taxes upon property (the notables themselves were all landed proprietors), and proposed instead several measures, among others a loan on life annuities, and the formation of a council of finance. The king adopted their measures, and then dissolved the assembly. A paper-war now took place between Necker and Calonne on the respective merits of their administrations, and Calonne, being detected by the king in a falsehood, was dismissed. Several successive ministers followed for short periods, but they could do nothing to retrieve the ruinous state of affairs, and at last Necker was recalled. He stated to the king that the only resource left was to call together the states-general of the kingdom, which had not been assembled since 1614. The king convoked them at Versailles in May, 1789. These states had always consisted of the three orders, clergy, nobility, and the third estate, or commons. Every order formed a separate house, in which it discussed the measures proposed by the government, and decided by a majority of votes. By this means any project of law displeasing to the two privileged orders was sure not to pass those two houses, and was therefore lost. Necker, to obviate this difficulty, proposed to give to the third estate a double vote, so as to balance the votes of the other two houses. The king, after some hesitation, gave this double vote to the third estate, and this was in fact the beginning of the Revolution. It is remarkable that Monsieur, the king's brother, afterwards Louis XVIII., was one of those who supported this organic change.

On the 5th of May, the three estates having assembled in the common-hall, the king opened the session by a temperate speech, which was much applauded, after which the clergy and nobility withdrew to their separate rooms to deliberate among themselves. The third estate remained in the common-hall, and in the following sittings proposed that the three orders should assemble and deliberate together, which the other two refused. On the 10th the third estate elected Bailly for their president; and on the following day they were joined by several deputies of the clergy. On the 17th, on the motion of the abbé Sièyes, the third estate, joined by many of the clergy, constituted themselves as a national assembly, and resolved that as soon as that assembly should be prorogued or dissolved, all taxes not sanctioned by it should cease to be legal. The court was alarmed at these innovations, and the king announced that he was going to hold a royal sitting. Meantime the doors of the hall of the assembly were closed, and a guard placed there to prevent the deputies from entering. Bailly led them, on the 20th, to the 'Jeu de paume,' where they swore not to separate until they had framed and enforced a new constitution for the kingdom, and the redress of existing grievances. On the 23rd the king convoked the three estates in the common-hall, and after qualifying the resolutions of the 17th preceding as illegal, ordered the estates to leave the hall, and withdraw each to their appropriate chamber, to deliberate there upon certain subjects which he laid before them. After the king's departure, the third estate, joined by part of the clergy, refused to leave the hall, and when the grand-master of the ceremonies came to enforce the king's order, Mirabeau answered him, that they were there to fulfil their duty towards their constituents, and that force alone should disperse them. On the 25th, part of the deputies of the nobility joined the third estate, and the name of national assembly was publicly recognised. The events that followed rapidly are too numerous and too generally known to be inserted in this article. The national assembly, by the constitution it formed, changed the old French monarchy into a representative republic, with a single chamber, and an hereditary magistrate, with the name of king, whose power however was rendered insignificant and nugatory. They suppressed not only the feudal jurisdictions, but also the manorial dues and fees; the titles of nobility; the tithes, convents, and the corporations of trades; they confiscated the property of the church; they abolished the old division of the kingdom by provinces, and ordered a new one by departments: they changed entirely the social relations of the country, so that even Mirabeau was startled at the rapidity with which they were legislating, and began to express ominous doubts of the result. (Dumont, *Souvenirs de Mirabeau.*) 'It is easy to destroy,' he said, 'but we want men able to reconstruct.' Paine's pamphlet on the supposed 'Rights of Man' was gravely assumed by that assembly as the basis of their political theory. Meantime insurrections broke out in Paris and in the provinces: not only the abominable Bastille was taken and destroyed, July, 1789, but the châteaux, or manorial residences of the nobility, all about the country, were attacked and burnt, with many acts of atrocity. On the 6th October the palace of Versailles was entered by a mob from Paris, the body-guards were murdered, the royal family were in great danger, and at last the king consented to remove to Paris, whither he was escorted by the armed populace. On the same day the famous club of the Jacobins began its meetings at Paris. [Jacobins.] The emigration of the nobles had already begun: several members of the royal family repaired to Germany and Italy. The year 1790 was passed amidst alarms and insurrections in the interior, and rumours of foreign war, amidst which the assembly continued its labours for the new organization of France. It passed a law requiring of all the clergy the oath of fidelity to the new constitution: the pope forbade the oath as schismatic, and many of the French clergy refused to take it, but they were dismissed from their functions and replaced by others more docile, who however had not the confidence of the more religious among their flocks. Thus religious schism was added to civil feuds. The king himself was obliged to send away his chaplains. He had by this time become weary of being a mere puppet in the hands of the assembly, which had despoiled him of almost every royal prerogative, even of the right of pardoning; the 'veto,' or power of suspending for a time the passing of an obnoxious law, had also become illusory, for whenever he attempted to exercise it, an insurrection broke out, which, by frightening the court, obliged the king to submit.

In June, 1791, Louis, with his consort, his sister, and his children, endeavoured to escape from France, but was stopped at Varennes, and brought back to Paris. In the following September the assembly, having completed the new constitution for France, presented it to Louis, who, after making some remarks on what he conceived to be its deficiencies, swore to observe it. This act acquired him a few moments' popularity; and the assembly, having stated that the object for which it had met was completed, closed its sittings on the 30th September. The assembly consisted of 1118 members, of whom 272 were barristers and solicitors, 90 were judges and other magistrates, 208 belonged to the parochial clergy, 241 were gentlemen of noble birth, 48 archbishops and bishops, 35 abbots and canons, 176 merchants and landed proprietors, and the rest physicians and men of other professions. If that assembly committed errors, they were errors of judgment, for the majority were certainly sincere in wishing to maintain the kingly office, which they thought compatible with democratic institutions. Through a mistaken delicacy however they committed a very serious blunder before they parted; for they resolved that no member of that assembly should be eligible to the next assembly of the representatives of the nation, which became known by the name of the legislative assembly, and which was composed of much worse materials. The majority in the legislative assembly were men hostile to the monarchical principle altogether; they were divided between Girondins and Jacobins. [Girondins.] They began by sequestrating the property of the emigrants; they issued intolerant decrees against the priests who would not swear to the constitution, and by these means obliged them to run away from France; they treated the king with marked disrespect, dismissed his guards, provoked the war against Austria and Prussia, encouraged republican manifestations in various parts of the country, and even in the army, established extraordinary courts to judge the emigrants and other people disaffected to the new order of things (the word 'incivisme' was invented to designate this new offence), and issued an enormous quantity of paper money, which quickly becoming depreciated, added to the general misery. [Assignats.]

The king endeavoured, by the use of his 'veto,' to check this headlong career. An insurrection in June, 1792, was the consequence; the palace of the Tuileries was assailed and entered by the mob, which treated the royal family with the greatest insolence, threatened their lives, and obliged the king to put on a red cap and show himself at the window to the crowds below. A second insurrection, better organized, with the avowed object of abolishing the kingly office, was supported by a party in the legislative assembly. The mob again attacked the Tuileries on the 10th of August, and after a desperate defence by the Swiss guards, entered it and massacred all the inmates. The king and royal family had time to escape and take refuge in the hall of the legislative assembly. The assembly deposed the king, sent him and his family prisoners to the Temple, proclaimed a republic, and convoked a national convention to exercise the sovereignty in the name of the people. In September the massacres of the political prisoners began; the cry of 'aristocrat' became a sentence of death against any obnoxious person. On the 21st September the national convention opened its session, and shortly after prepared to bring the king to trial. The principal heads of accusation were, his attempt to dissolve the states-general in 1789, his escape to Varennes, and other acts previous to his accepting the constitution of 1791. Since his acceptance of it there was no charge that could be substantiated against him, except the exercise of the prerogatives given to him by the constitution, such as the 'veto,' and changing his ministers. The rest were mere insinuations and surmises of having bribed deputies, corresponded with the hostile powers, &c. The trial was opened in December. The Girondins and the Jacobins united against Louis, and he was found guilty of 'treason and conspiring against the nation.' The sentence was pronounced on the 16th January, 1793. Of 721 members present who voted in the convention, 366 voted for death unconditionally, 288 voted for imprisonment and banishment, and the rest voted for death, but with a respite, hoping thereby to save his life. The majority which sent Louis to the scaffold was only five.

On the 21st January, 1793, Louis XVI. was taken in a coach to the Place Louis XV., where the guillotine was fixed. He appeared silent and resigned, and engrossed by religious thoughts. Having ascended the scaffold, he attempted to address the people, but Berruyer, the commander of the national guards, ordered the drums to beat. Louis then gave up the attempt, took off his coat and cravat, and laid his head on the block. He was beheaded at ten o'clock in the morning. His consort Marie Antoinette was tried, condemned, and beheaded in the following October. The character of that unfortunate princess has been rescued from unmerited obloquy and the malignity of her enemies by Madame Campan in her 'Mémoires sur la Vie privée de Marie Antoinette,' London, 1823. Louis left one son, styled Louis XVII., and one daughter, who married her cousin the duke of Angoulême.

(*Nouvelle Continuation de l'Abrégé Chronologique de l'Histoire de France* par le Président Hénault, vols. v. and vi., Paris, 1822.)

LOUIS XVII., duc de Normandie, second son of Louis XVI., styled Dauphin after his elder brother's death in 1789, remained in prison in the Temple after the death of his parents, and there he died of disease in consequence of ill treatment and privation, on the 9th of June, 1795. He was then ten years of age. He had been styled Louis XVII. by the royalists after his father's death.

LOUIS XVIII., Stanislas Xavier, count of Provence, born in 1755, was also styled 'Monsieur' during the life of his brother Louis XVI., who, just before his death, wrote to him, appointing him regent of France. After the death of his nephew, Louis XVII., in 1795, he assumed the title of king of France and of Navarre, although he was then an exile, and he was acknowledged as king by the Royalist emigrants, who composed a small court around his person. He had shown his liberal disposition in favour of rational reforms in France in the first period of the Revolution, but the violence of the Jacobins obliged him to emigrate in 1791. He lived for some time at Verona, in the Venetian territories, which he was obliged to quit when Bonaparte invaded Italy in 1796. He resided successively in various parts of Germany, and at last settled at Warsaw, but in 1803 removed to Mittau in Courland, under the protection of Russia. By the peace of Tilsit, 1807, he was obliged to leave the Continent, and he repaired to England, where he fixed his residence at Hartwell in Buckinghamshire till 1814, when events in France opened the way for his return to the throne of his ancestors. He landed at Calais in April of that year, and proceeded to St. Ouen, from whence he issued a proclamation acknowledging himself as a constitutional, and not an absolute king; promising the speedy publication of a charter, a total oblivion of all the past, and guaranteeing all the possessors of what was called national property. On the 4th of June he laid before both the senate and legislative body a charter which he had drawn up with the assistance of his ministers, and which was unanimously accepted, and became the fundamental law of the kingdom, and such it remains to this day, with a few alterations introduced in 1830.

Louis was sincere in his professions, but he was surrounded by disappointed emigrants and old royalists, whose imprudence injured him in the public opinion; whilst on the other side he had against him the Bonapartists, a formidable body, including the greater part of the army. A conspiracy was hatched against Louis, Bonaparte returned from Elba, and Louis, forsaken by all, retired to Ghent. [Bonaparte, Napoleon.] The battle of Waterloo, June, 1815, opened again to Louis the way to Paris; but this time he appeared as an insulted and betrayed monarch. Those officers who, in spite of their oaths to Louis, had barefacedly favoured Bonaparte's usurpation, were tried and found guilty of treason: some were shot, and others exiled. The new Chamber of Deputies, which was elected under the excitement of this second restoration, proved ultra-royalist in principle, and went further than the sovereign. They banished all those who had voted in the convention for the death of Louis XVI., as well as those who had accepted office under Napoleon after his return from Elba. Meantime sanguinary reactions took place in various parts of France, especially in the south, where the old animosity of the Catholics against the Protestants was revived by political feuds. At last Louis himself saw the danger to which the violence of his pretended friends exposed him, and he dissolved the chamber, which was styled 'La Chambre Introuvable.' In the new elections the moderate constitutional party regained the ascendancy, and the king, in 1818, appointed a liberal ministry, at the head of which was Count Decazes. But the assassination of his nephew the Duke of Berry, by a fanatical republican, in February, 1820, again alarmed the court, and restored the influence of the ultra-royalists. Decazes was dismissed, and Villèle was placed at the head of the ministry. The law of election was altered, the newspapers were placed under a censorship, and other measures of a retrograde nature were adopted. No open violation of the constitution however was committed. In 1823 Louis, in concert with the Northern powers, sent an army into Spain under his nephew the duke of Angoulême, to rescue Ferdinand from his state of thraldom. [FERDINAND VII.] The expedition was successful; it restored Ferdinand to the plenitude of his power; but it did not succeed in restoring to Spain order and good government. In September, 1824, Louis XVIII. died, having been a long time ill and unable to walk: he retained to the last his mental faculties and his self-possession. He left no issue, and was succeeded by his brother Charles X. Louis had a cultivated mind, considerable abilities, and a pleasing address: his ideas were enlightened and liberal, and in ordinary and settled times he would have proved an excellent constitutional king; as it was, he managed to steer tolerably well between extreme opposite parties, and in a most critical period. He published, in 1823, the account of his emigration, 'Relation d'un Voyage de Paris à Bruxelles et Coblenz,' which is curious. (See also *Mémoires de Louis XVIII., par le Duc D.*' an assumed title, Paris, 1832.

LOUIS, or LOUIS D'OR, a gold coin in the old system of France, first struck under Louis XIII., in 1641. Kelly says, 'the Louis d'ors coined before 1726, which passed then for 20 livres, were coined at the rate of 36½ per French mark of gold, 22 carats fine; the remedy in the weight was 14 grains per mark, and the remedy in the alloy one-fourth of a carat. These ceased to be a legal coin in France as far back as 1726; but they still continued to circulate through many parts of Germany and Switzerland, where they had a fixed value, and were known by the name of "the old Louis d'ors;" they are mentioned under that name in all the editions of Kruse, Ricard, and in other books on exchange printed before 1786.' 'From the year 1726 till 1785 Louis d'ors were coined at the rate of 30 to the mark of gold 22 carats fine, and with a remedy of 15 grains in the weight, and $\frac{12}{32}$ of a carat in the alloy; thus at least $30\frac{150}{1531}$ pieces were coined from a mark $21\frac{20}{32}$ carats fine. These ceased to be current in France in 1786.' 'In Holland, Germany, &c., they were called "new Louis d'ors," to distinguish them from those last mentioned.' 'In 1785 and 1786 all the gold coins in France were ordered to be brought to the mint to be melted down; and a new coinage then took place at the rate of 32 Louis d'ors to the mark, of the same degree of fineness, with the same allowances for remedy as above: thus at least $32\frac{160}{1531}$ pieces were coined from a mark of gold $21\frac{20}{32}$ carats fine. The intrinsic value of this new Louis d'or (allowance being made for the remedy) was 18*s.* 9¼*d.* sterling; and 1*l.* sterling = 25 livres 10 sous Tournois in gold.' Louis d'ors were considered as a current coin in most parts of the Continent; though in England they were sold only as merchandise, where at different periods, according to the demand, their price fluctuated from 18*s.* 6*d.* to 21*s.* sterling. Upon the return of the Bourbon family, the twenty-franc pieces struck by Louis XVIII., in imitation of the Napoleons, received the name of Louis, or Louis d'or; a designation which is likewise given occasionally to the same coin struck by King Louis Philippe, but which are more ordinarily called twenty-franc pieces.

The old Ecus, coined before 1726, were called LOUIS-BLANCS, and LOUIS D'ARGENT.

(Furetière, *Dict. Universelle;* Kelly's *Universal Cambist*, edit. 1811, vol. i., pp. 146, 147; ii., 202.)

LOUIS, ST. [MISSOURI.]

LOUISBOURG. [CAPE BRETON.]

LOUISIADE ISLANDS is the name of an extensive group of islands situated in the Pacific, south-east of the great island of Papua, or New Guinea, between 8° and 12° S. lat. and 150° and 155° E. long. It is generally supposed that this group was discovered by Bougainville in 1768, but it is more probable that Torres found these islands in 1600, after having traversed the strait between Australia and New Guinea, which still bears his name.

Few islands of the Pacific have been less visited by European vessels than New Guinea and Louisiade, and our information respecting them is accordingly extremely scanty. We do not even know the number of the islands which belong to the last-mentioned group, but it is certain that they are very numerous. They occupy a space of more than 300 miles from north-west to south-east, but none of them appear to be large. So far as a rough conjecture may be formed, there is not one that exceeds forty miles in length. Some of them rise to a considerable elevation; they generally appear to be very fertile. The inhabitants belong to the race of the warlike Papuas, and are very averse to any intercourse with foreign vessels which visit the dangerous sea that washes the southern coast of these islands. It is supposed that they are cannibals. The inhabitants make large pirogues, or canoes, and use shields as a defensive armour.

(Bougainville, *Voyage round the World;* D'Entrecasteaux, *Voyage round the World.*)

LOUISIANA, the most south-western of the United States of North America, comprehends the countries on both sides of the Mississippi between 28° 56′ and 33° N. lat., and 88° 50′ and 94° 30′ W. long. The Gulf of Mexico washes its shores on the south for about 400 miles. The Sabine river separates it on the west from the Mexican province of Texas. This river constitutes the western boundary-line for 200 miles; the remainder of the line, about 69 miles, runs along the meridian of 94° 30′ to 33° N. lat. On the north the parallel of 33° N. lat. constitutes the boundary-line between Louisiana and Arkansas for 172 miles. Between 33° and 31° N. lat. the Mississippi separates Louisiana from the state of Mississippi, the course of the river between these parallels being 235 miles. The remainder of the boundary between these states lies along 31° N. lat., between the Mississippi and Pearl rivers, and then along the last-mentioned river to its mouth; the former distance is 106 and the latter 60 miles. The area of Louisiana is calculated at 48,220 square miles, or only about 2000 miles less than that of England.

Surface and Soil.—Louisiana presents a great variety of surface, though it is a plain country, and only in a very few places rises into hills of moderate elevation. But the plains are on different levels, a circumstance which causes a great variety in soil, climate, and agriculture, and gives to the different regions entirely different features.

The delta of the Mississippi extends along the shores of the Gulf of Mexico from Atchafalaya Bay on the west (91° 40′ W. long.) to the Pass de Marianne (89° 15′ W. long.) and Lake Borgne on the east, and comprehends a coast-line of above 250 miles. From Lake Borgne its boundary runs westward through the lakes Pontchartrain and Maurepas, and then along the Amite and Iberville to the place where the last-mentioned river, or rather channel, leaves the Mississippi. It then follows the course of the Mississippi to the great bend above the mouth of the Homochitto river, about 31° 15′ N. lat. Hence it crosses the Mississippi westward, and continues along the course of Red River to the neighbourhood of the rapids. At this place begins the western boundary of the delta, which follows the course of the Bayou Bœuf up to its union with Bayou Crocodile. Farther south the river Teche up to its influx into the Atchafalaya branch of the Mississippi may be considered as the boundary-line, and afterwards the Atchafalaya to its mouth in Atchafalaya Bay. The whole country contained by these boundary-lines, and comprehending about one-fourth of the state, or more than 10,000 square miles, is for six months of the year either covered with water or a swamp. The swamps extend along the sea, and are called the marshes; the inundated region lies north and west of the marshes.

The marshes are nearly on a level with the sea at high tide. They are destitute of trees and shrubs, but covered with grass, which however is quite useless, as the swamps can only be traversed in boats by following the numerous watercourses which intersect them. Between the mouth of the Atchafalaya and La Fourche branches of the Mississippi the marshes extend only about twenty miles inland, and terminate on the southern border of the elevated tract called Terre Bonne, the only part of the delta which exhibits any considerable extent of surface not subject to inundation: the larger portion of the Terre Bonne is a prairie. Between La Fourche Bayou and the Mississippi the marshes extend much farther inland to the shores of Quacha or Barataria, and the great bend of the Mississippi south-east of New Orleans. East of the Mississippi only a small tract south of Lake Borgne is not marshy; but along Lake Pontchartrain the marsh does not occupy much more than the peninsula which separates Lake Borgne from Lake Pontchartrain. The cultivated part of this marshy region is confined to the very narrow banks of the water-courses, and even there settlements are only formed on the northern borders of the marshes, on account of the great unhealthiness of this region.

The inundated region comprehends more than two-thir
of the delta. It may be divided into two portions, t

deeply inundated, and the less deeply inundated tract. All that part of the delta which is west of the Mississippi and of the Bayou la Fourche, with the exception of a tract west of Baton Rouge, is deeply inundated from February to August, during which period it forms an immense lake. Not even the banks of the Atchafalaya are free from inundation. The common depth of the water is six feet, but in many parts, especially where the Red River joins the Mississippi, it is much more. During the remainder of the year it is dry and the soil firm. The whole region is covered with high and valuable forest-trees, but no settlements have been formed in this country. It may be compared with the immense inundated plains on the southern banks of the Amazon river.

The country east of the Mississippi and of the Bayou la Fourche, as well as the tract of higher ground west of Baton Rouge, is only inundated to the depth of three or four feet, and the inundation ceases a month or six weeks sooner. The banks of the rivers also are several feet higher than in the country farther back, so that they are at most only slightly inundated. The greatest part of this country is indeed covered with trees, but there are also tracts without wood. As the more elevated banks of the rivers extend in width from a quarter of a mile to a mile, numerous settlements have been formed on them. The most valuable are those along the Bayou la Fourche and the Mississippi Proper. On the former they begin about twenty miles from the sea, and on the latter at Fort St. Philip, about 50 miles from the mouth of the river. To protect the cultivated ground from the annual inundation a bank of earth, called *levée*, has been formed on each side of the Mississippi. It begins at Fort St. Philip (29° 25′ N. lat.), and extends to the higher grounds of Baton Rouge (30° 30′), a distance of 130 miles. In some places above New Orleans this embankment is fifteen feet high and thirty wide at the base, but generally it does not exceed twelve feet at the base and five in height.

If we compare the delta of the Mississippi with that of the Ganges, the marshes correspond to the Sunderbunds, except that they are not covered with trees. The inundated portion of the American delta has however this disadvantage, that its waters do not run off in a straight course, but are deflected by the high grounds along the prairies of Opelousas and Attakapas, and farther on by the high land of the Terre Bonne. This circumstance retards their efflux, which is still further retarded by the extremely small slope of the inundated tract. The tide of the Mexican Gulf, though it does not rise above three feet, unless it is impelled by southerly winds, ascends the Atchafalaya to the influx of the Courtableau, a distance of more than 100 miles. Thus the water becomes nearly stagnant in the greater part of the inundated country, and produces many dangerous diseases. This circumstance, added to the difference of climate, renders it very doubtful if the delta of the Mississippi ever can acquire a population and a degree of cultivation approaching that of Bengal.

The country west of the delta to the Sabine river is likewise bordered by a broad belt of marshes along the sea. They extend hardly ten miles inland along Cote Blanche Bay and Vermillion Bay, but from 20 to 30 miles inland west of Vermillion Bay. These marshes however are not quite destitute of trees: several clumps of live oak occur in them, especially on both sides of Mermentou river. North of the marshes the country rises considerably, and extends in open prairies, which are generally destitute of trees, but covered with grass. The prairies are traversed by numerous rivers, whose narrow bottoms are overgrown with trees, and contain fertile tracts. A few settlements have been made on these bottoms, but the prairies themselves are almost entirely inhabited by the tribes of the Attakapas and Opelousas, the Bayou Queite Tortue constituting the boundary between these tribes. The prairie of the Attakapas extends in a narrow strip south-eastward between the marshes along Vermillion and Cote Blanche Bay and the river Teche. The banks of the last-mentioned river form the western boundary of the inundated country, but they are above the line of the inundation, and contain many rich cultivated tracts. To the west and north-west of the prairies of Opelousas lies an extensive wooded region, which on the Sabine extends to 30° 10′, and terminates not far from the marshes. It occupies the country about the northern half of the course of the Calcasiu river, and approaches the inundated country of the delta on the Bayou Bœuf, a branch on the Courtableau. The whole of this extensive tract is covered with pine-forests, and the soil is of very indifferent quality. It is an undulating plain, except at the most north-western angle of Louisiana, between the upper course of the Sabine river and the Red river, where it rises into high hills.

Red River may be considered as the boundary of this wooded region. Where it enters Louisiana, high grounds covered with pine-trees approach to the margin of the river on both sides, but about 60 miles lower down a remarkable depression of the surface extends from north-north-west to south-south-east, and is about 60 miles long with a mean width of eight miles. It terminates at Grand Ecor, 4 miles above Natchitoches. On entering this low tract the river divides into numerous branches, presenting a most intricate maze of islands, inlets, channels, and lakes, of every size from one to thirty miles in length. Lake Bistineau is 40 miles long and from one to three wide, and Lake Bodeau 30 miles long and from one to ten wide. The whole of this low region is inundated from one to twenty feet during the months of February, March, and April, but in summer the lakes and low grounds are nearly dry, and in October and November they become meadows covered with a carpet of green and succulent herbage. There are yet no settlements in this country, though it seems better adapted to them than the lower part of the delta. Below Grand Ecor the inundation of Red River appears not to extend beyond its bottom, which is rather wide, and the higher grounds which skirt it as far as the rapids near Alexandria have rather a fertile soil: numerous settlements have been formed below Natchitoches.

The country extending from Red River on the west to the Mississippi river on the east consists mostly of elevated woodland, especially that portion which lies west of the Washita or Ouachita river. In this region, east of Lake Bistineau, is the highest land of Louisiana. It consists of numerous hills rising from 100 to 200 feet above their base they are covered with trees, chiefly pine and oak, thinly interspersed with ash, hickory, and dog-wood, and produce a luxuriant herbage in summer and spring. Farther east these hills sink into a plain, which extends to the Washita and river Bœuf, a confluent of the former. This plain is nearly a level, has a sandy soil, and is mostly covered with pine-forest; but the river bottoms are wide, and have a fertile soil. The settlements are still few, and do not extend beyond the bottoms. Where however the rivers Washita and Bœuf approach one another, an extensive tract of fertile land occurs, on which the settlements increase rapidly. The country on both sides of the Black River, which is formed by the junction of the river Bœuf with the Washita, resembles in every respect the less inundated part of the delta. But between the river Bœuf and the Mississippi, and especially along the banks of the latter, is a low tract traversed by the river Tensas, a confluent of Black River, which is likewise inundated by the water which issues from the Mississippi in the first half of the year. Narrow strips along the river become quite dry in the second half of the year, but the greater part of this tract is a swamp, which produces fine timber-trees, especially cypress. From these forests New Orleans is supplied with lumber and fuel.

Along the east bank of the Mississippi extends an elevated country, broken by numerous streams. Its projections, worn away by the action of the river, are known by the name of Bluffs. They rise more than 100 feet above the alluvial plains near the Mississippi. These hills continue eastward for 15 or 20 miles from the banks, and lie scattered about in wild confusion. They are overgrown by mingled forests of oak, sweet gum, poplar, tulip-tree, hickory, and some pine, and have an almost uniformly productive soil. By degrees the hills disappear, and are followed by a plain which is considerably elevated above the delta. This plain has a sandy sterile soil, and is entirely overgrown by pitch-pine. On the south it does not extend to the lakes of Maurepas and Pontchartrain, but begins imperceptibly to lower, at a distance of about ten miles, until it advances to the river Amite and the lakes, where it terminates in narrow swamps, which line the banks of the river and lakes. On this declivity of the more elevated plain the number of settlements is greater than in any other part of Louisiana of equal extent. The soil, though light, is well adapted to the cultivation of cotton, and the extensive pine-forests produce abundance of pitch and tar.

Rivers and Lakes.—The Mississippi enters Louisiana at its most north-eastern corner, 33° N. lat., but receives no accession of water from the right until it has attained 31° N. lat., where it is joined by the united waters of Red and Black rivers, which together probably drain a tract of 100,000 square miles, and bring down an immense body of water during the spring months. A mile and a half below the mouth of Red River the Mississippi sends off its first great branch, the Atchafalaya, which, flowing in a southern and south-eastern direction, traverses the lowest part of the delta, enters the south-eastern part of lake Chetimaches, and issuing from it, passes through the marshes into Atchafalaya Bay. [ATCHAFALAYA.] Lake Chetimaches, or Grand Lake, is about 40 miles long and from two to five wide; at its southern extremity it is 40 feet deep. It is connected with the Atchafalaya by several natural channels, which traverse the intervening country, and divide it into many slands, making a kind of net-work.

From the Atchafalaya the Mississippi flows in a general south-eastern direction, but with many great bends. About 30° 20′ N. lat. the river sends off the second great branch, the Iberville, which runs eastward, and joins the Amite river. The united stream, preserving the latter name, falls nto Lake Maurepas, a circular sheet of water about 8 miles n diameter. This lake is united to the lake of Pontchartrain by the Pass of Manchac. Lake Pontchartrain is in the form of an ellipse 20 miles by 32, and from 18 to 20 feet deep. This lake is connected with Lake Borgne by two channels, of which the southern is called Chef Menteur, and the northern the Rigolets. Lake Borgne, though denominated a lake, is really a bay of the Gulf of Mexico, and connected with it by the Pass de Marianne. The Iberville river, before its union with the Amite, has but three feet water, and that only during three months of the highest overflow. A few miles below the efflux of the Iberville, the Mississippi sends off another branch to the west, the Plaquemines, which is only six miles long, and joins the Atchafalaya. Though it has only water during the high flood, it is important for the internal navigation. Farther down occurs the last great efflux of the Mississippi, the La Fourche (the Fork). It leaves the principal river at Donaldsonville, and flows in a south-eastern direction for 90 miles; it has 9 feet water on its bar, and admits vessels drawing 4 or 5 feet to within 30 miles of its efflux; but the upper part of its course is very shallow from September to March. From the efflux of the La Fourche the Mississippi flows east to the town of New Orleans, and thence to the sea in a south-eastern direction. Shortly before it reaches the Gulf of Mexico it divides into six branches, called the West, South-west, South, East, North-east, and L'Outre Pass. The most frequented is the East Pass, with 12 feet water at ordinary tides; the South-west Pass is nearly as deep as the East Pass. The other passes have from 5 to 8 feet water, but they are rarely frequented. The depth of the water increases rapidly in the channels, so that it is upwards of 30 feet within a mile from the bars, and still greater farther upwards. For further particulars see MISSISSIPPI. In the inundated tract there is a great number of lakes of different sizes. The largest is lake Quacha or Barataria, south-south-west of New Orleans, which is 22 miles long and six wide. As these lakes are united, either with one another or with the chief branches of the Mississippi, some of them facilitate the internal navigation, especially Lake Palourde and Lake Verret, which are united with one another and with the Atchafalaya and La Fourche, branches of the Mississippi.

Red River, which rises in the Rocky Mountains, traverses Louisiana with a general south-east course of 200 miles, but by the windings of the river of above 300 miles. The navigation is interrupted only by the rapids in 31° 20′ N. lat., where two ledges of rocks extend across the channel about three-quarters of a mile from each other; but when the the water is high the rocks form no obstruction to the passing of boats. In the low country above Natchitoches, where the river divides into many branches, the navigation is intricate and troublesome.

The other rivers of Louisiana are unimportant as channels of navigation. The Sabine, which divides the country from Texas, rises in the last-mentioned country. Its general course is nearly south, with an elliptical curve to the east: it flows upwards of 300 miles. Before it enters the sea it flows into a shallow lake 30 miles in length, and from three to five wide. In ordinary tides there is not above three feet water on its bar. East of the Sabine is the Calcasiu, which rises in the angle between the Red River and Sabine, flows parallel to the last-mentioned river at a distance of about 35 miles, expands near its mouth likewise into a large but shallow lake, and has also only three feet water on its bar. Its course is upwards of 200 miles. The Mermentou, which flows to the east of the Calcasiu, is properly only the channel by which Lake Mermentou discharges its waters into the Gulf of Mexico. This lake is of considerable extent, and receives most of the waters which originate on the prairies of Opelousas, but the different streams unite before they enter the marshes in one river, which receives the name of Mermentou, and soon afterwards falls into the lake. It is not better adapted for navigation than the Sabine and Calcasiu. Sixty miles east of the mouth of the Mermentou are two large bays, Vermillion Bay and Cote Blanche Bay, which are united by several passes with the Gulf of Mexico. The bays have twelve feet of water, but the passes only five or six feet. Vermillion Bay receives the river of the same name, which rises on the prairies of Opelousas, 30° 30′ N. lat., and runs in a general southern course about 80 miles. It is navigable for vessels of five feet draught to a considerable distance.

Climate.—The opinion of Volney, that the countries along the Mississippi have a much milder climate than those along the Atlantic, is now known to be incorrect. On the contrary, it has been proved by many observations that the mean temperature of the latter, under the same parallel, is from two to three degrees higher than that of places west of the Appalachian Mountains. It is found that the seasons are milder at Charleston, South Carolina, 32° 42′ N. lat., than at New Orleans, in 30° N. lat. A considerable difference is observed between the climate of the low and high lands of Louisiana. In the low lands it seldom snows, and frost is not frequent, but in the winter of 1814 the ponds and lagoons near New Orleans were frozen so as to admit half-grown boys to skate or play on the ice. (Darby.) This extreme cold however is a rare occurrence, the thermometer commonly not sinking to the freezing-point. In summer the heat is great, and lasts from the beginning of July to the close of September; the thermometer then ranges between 75° and 85°, and sometimes rises to 90° and even 96°. At this time the inundation ceases, and the decomposition of animal and vegetable matter infects the air, and produces dangerous diseases, especially fevers. The mean temperature of the year at New Orleans, according to Darby, does not exceed 63°, or about 13° above that of London, which is 21 degrees nearer the pole. On the higher grounds, especially on the open prairies of Opelousas, the climate is much more severe. In 30° 30′ N. lat. the snow has fallen to a depth of 11 inches, and remained for several days on the ground. It seems that frost occurs there every winter, and even sometimes in April and September, so that at Natchitoches it does great injury to the cotton and tender plants. In July there are heavy rains and thunder, and in August sometimes hurricanes blow from the south, which cause great damage by forcing the water of the Mississippi into the adjacent level country. In winter the north-western gales, which are very cold, produce great and sudden changes in the temperature.

Productions.—The species of grain chiefly cultivated for food are rice and Indian corn. The rice forms an article of export. Wheat, rye, barley, and oats are more cultivated towards the north than in the southern districts, but nowhere to any great extent.

Sugar succeeds very well south of 31°; farther north its cultivation is less advantageous and more expensive, as the plants are destroyed by the cold, and must annually be replaced. Cotton, which is the staple article, succeeds everywhere, and is of excellent quality. Good tobacco is raised in different places, but its cultivation is on the decrease. The mulberry-tree is indigenous. The cultivation of indigo, which was formerly carried on to some extent, has generally given way to that of cotton. Vegetables are not extensively cultivated, with the exception of the sweet potatoe. The orange-tree and the purple fig do not succeed farther than 30° N. lat. The pomegranate-tree, the peach, and vine, succeed wherever they are cultivated, but the apple only in the northern districts.

By far the greatest part of the surface of Louisiana is covered with forests. The pine-tree, which is most abundant, covers the northern and western sandy districts, and is extensively used in the manufacture of tar and pitch. On the declivities by which the prairies or wooded region descend to the inundated grounds, the forests mostly co sist of oak, sweet-gum, poplar, tulip-tree, and hickory, of various species; the same trees occur on the broken country east of the Mississippi: the chincapin grows on the borders of the inundated lands.

Immense herds of cattle are raised on the natural meadows of Opelousas and Attakapas, as likewise horses and mules. The bison or buffalo is at present only met with towards the northern and western border, especially between the Sabine and Red River, where also wild horses are found. Deer is only plentiful in the prairies of Opelousas and in the pine-forests. Bears, lynxes, the American panther, and beavers are rare, but wolves are numerous. Locusts infest the prairies, and numerous serpents the woods and lowlands. The alligator occurs in all the rivers, but is most numerous in the bays and lakes of stagnant water: it is not dangerous, except when attacked or wounded. The Mississippi and its branches abound in fish. The forests swarm with birds, among which are the wild turkey, the paroquet, the pelican, the flamingo, and the humming-bird. Swans, geese, and ducks are very numerous on the lakes and stagnant waters along Red River.

Clay occurs in the alluvial soil of the delta, at a depth of from ten to thirty feet along the Mississippi. There are salt springs in the northern districts, on the high grounds from the Mississippi to Sabine river, and several of them are turned to advantage. Coal exists in the same places, and iron-ore is found in the north-western corner, between the Sabine and Red River.

Inhabitants.—The inhabitants of European and African origin amounted in 1820 to 153,407 individuals, of whom 73,867 were whites, 10,476 free coloured persons, and 60,064 slaves. A considerable part of the population are the descendants of French settlers; and some newspapers were a few years ago, and probably still are, printed both in the French and English languages. According to the census of 1830 the number of free people was 106,130, and that of the slaves 109,630. The great increase of the slave population is to be ascribed to the increased culvation of cotton and sugar.

The native tribes are not comprehended in this census; but their number probably does not exceed a thousand individuals. On the prairies are the Attakapas and Opelousas, but these tribes are far from being numerous; they have no fixed habitations, and live mostly from the produce of the chase. The Chocktaws, on the Washita and Red River, are more numerous. They have adopted agriculture, and their villages are not much inferior to those of the other inhabitants; they chiefly cultivate Indian corn and the sweet-potatoe. The Tensas, between Bœuf and Tensas river, towards the northern boundary of Louisiana, are few in number.

Political Geography.—For political and civil purposes Louisiana is divided into thirty-one parishes. The present capital and seat of government is the town of Donaldsonville, situated at the efflux of the La Fourche branch from the Mississippi: it has much increased since the seat of government was removed to it. The largest town of Louisiana, and one of the most commercial towns of the United States, is New Orleans [Orleans, New], on the left bank of the Mississippi, 105 miles above its mouth. All the other places are inconsiderable. Baton Rouge, on the Mississippi, contains only 1200 inhabitants; and Alexandria, on the Red River, hardly more. Natchitoches, on the last-named river, has not 2000 inhabitants: it is at the head of the steam-boat navigation on Red River, and the centre of the trade to Mexico.

The United States granted to Louisiana 46,000 acres of land for the endowment of a college, and 873,000 acres for the support of schools; the State annually appropriates about 46,000 dollars for the support of parish schools. The college of Louisiana, which has an annual allowance of 7000 dollars from the state, is at Jackson; and a college has been incorporated at Opelousas.

Commerce.—Besides the valuable produce of its own soil, the productions of all the states and settlements within the extensive basin of the Mississippi river which are destined for a foreign market must pass through this state, because all the branches by which the river enters the sea are within its boundaries. As to this commerce see Orleans, New. The internal communication between the dispersed settlements and New Orleans is entirely carried on by water, as there is no carriage-road in Louisiana, with the exception of that which runs along the Mississippi on the Levée. Boats from 15 to 60 tons are conveyed from New Orleans by the Plaquemine into the Atchafalaya. Those destined for the lower part of Attakapas descend the latter river and enter their points of destination by the Teche. Those bound to the central parts of Attakapas descend the Atchafalaya about 20 miles, and are thence transported by an outlet and Lake Chetimaches to the Fausse Point landing. Here is a portage of 10 or 12 miles to S. Martinsville, the seat of justice for the parish of S. Martin's or Upper Attakapas. Vessels for the higher or central parts of Opelousas ascend the Atchafalaya to the mouth of the Courtableau, and thence by the latter stream to Larrell's Landing, six miles, or into Bayou Carron, four miles from the village of S. Landré. (Darby.) The settlements on the Lower Teche communicate with Donaldsonville and New Orleans by the lakes of Palourde and Verret, and by the inlets which connect these lakes with the Atchafalaya and La Fourche branches of the Mississippi.

History. —The Mississippi river was discovered by land. The Spaniards navigated the Gulf of Mexico for two centuries without being aware that one of the largest rivers of the globe falls into it. This fact may be explained from the circumstance that a low, flat, and dangerous coast extends on both sides of its mouth to a great distance. The French, after their establishment in Canada, got some information as to this river about 1660, but did not find its mouth before 1699, when M. de Iberville founded the first colony. The city of New Orleans was built in 1717, about which time the colony began to be of some importance. The French remained in possession of Louisiana up to 1763, when they ceded it to Spain. The colony was much neglected by the Spaniards, and improved very slowly, notwithstanding its numerous natural advantages. In 1800 the Spanish government re-ceded Louisiana to France, but the French government fearing that Louisiana would be taken from them, during the war that followed the peace of Amiens, by the superior naval force of England, sold it to the United States in 1803 for 15,000,000 dollars. At the time of the sale the inhabitants were chiefly French and descendants of French, with a few Spanish creoles, Americans, English, and Germans: the whole population did not exceed 90,000 inhabitants, of whom about 40,000 were slaves.

Louisiana comprehended all the country included in the present state of Louisiana, with the exception of that tract which extends on the northern shores of the river Amite, and the lakes of Maurepas and Pontchartrain, and in addition, the immense tract of country included between the Mississippi river and the Rocky Mountains. The country was then divided into several territories, of which Louisiana first rose to a state. In 1811 its population had increased to the number required by the federal constitution, and Louisiana was formed into a state in 1812. The legislative authority is vested in a house of representatives and a senate. The members of both houses are elected by all free white male citizens who have attained the age of twenty-one years. The senate consists of seventeen members, elected for four years; the number of representatives is at present fifty members, who are elected for two years. The executive power is vested in a governor. Louisiana sends two senators and three representatives to Congress.

At the time of the union of Louisiana with the United States, the civil laws of Spain, and also the Roman law to some extent, were in force. Some changes were immediately introduced for the purpose of bringing the condition of its inhabitants nearer to that of the other United States. Accordingly juries and the Habeas Corpus were introduced; but the antient laws still remained in force. Their defects were however so evident, that the legislature formed a new civil code, which was published in 1824. At the same time Mr. Edward Livingston was entrusted with the preparation of a new penal code, of which the first project was published in 1824, and the code itself was promulged in 1833.

LOUISVILLE. [Kentucky.]

LOULE′, a town of Algarve, in a broad and fertile valley, 8 miles north of Faro, which is on the sea-coast. [Algarve.] It contains 1600 houses and about 8000 inhabitants, several churches and monasteries, one of which is for poor ladies of good families, in which they manufacture very neat baskets with the fibres of the aloe (*Agave Americana*), prepared and dyed for the purpose, and which are sent all over Portugal, as well as artificial flowers and other similar articles. The town of Loulé is surrounded by walls and has a garrison: its territory is very fertile and well watered, and produces corn, wine, oil, and fruits. A number of fine carob-trees grow in the neighbourhood. Loulé has the title of a Marquisate, which is borne by the representative of a Portuguese family, allied by marriage to the present royal family. (Miñano; Link.)

LOURDES. [PYRENEES SUPERIEURES.]

LOUSE. [PEDICULUS.]

LOUTH, a maritime county of the province of Leinster in Ireland; bounded on the north by the county of Armagh and Bay of Carlingford, which separates it from the county of Down; on the east by the Irish Channel; on the south and south-west by the county of Meath; and on the west by the county of Monaghan. According to the map of Ireland published under the superintendence of the Society for the Diffusion of Useful Knowledge it lies between 53° 43′ and 54° 7′ N. lat., and between 6° 6′ and 6° 41′ W. long. According to the map of the Ordnance Survey of Ireland it extends from the Mattock river on the south to the Armagh boundary on the north, 25 statute miles; and from Dunany Point on the east to the Meath boundary on the west, 15 statute miles. From the sea at the bridge of Dundalk, however, to the Monaghan boundary, its breadth is only 6½ miles. The surface, according to the latter map, consists of

	Acres.	r.	p.
Land . .	202,336	2	36
Water . .	813	0	4
Total . .	203,149	3	0

or 317¾ square statute miles, being the smallest county in Ireland. In 1831 the gross population was 107,486.

From the Boyne to the river of Dundalk, comprising more than three-fourths of the county, the surface is of the same character with that of the great central plain of Ireland, of which it forms the north-eastern portion. The only eminences in this division at all conspicuous are in the southern part of the county, which they cross in a direction nearly east and west, forming a continuation of the hilly group which occupies the north-eastern angle of the county of Meath. The highest ground here is Belpatrick, near the county boundary, 789 feet. East from Belpatrick rises the round-backed hill of Collon, or Mount Oriel, wooded to the top, and forming a striking object for a distance of several miles in all directions. Near this is the very handsome though small town of Collon, adjoining the extensive demesne of Oriel Temple, the residence of Lord Ferrard. From Collon a low hilly range extends eastward, attaining its highest elevation in the hill of Tullyesker, 616 feet, and terminating in the promontory of Clogher-head, which rises 181 feet above the Irish Channel. The heights belonging to this range are cultivated to the top, and present no abrupt or striking outlines. Between them and the Boyne the country, except along the immediate valley of the river, possesses few features of interest. Near the coast, about midway between the Boyne and Clogher-head, is the village of Termonfeckin, situated on a stream running eastward from Tullyesker to the sea.

On the other side the Mattock river, rising between Tullyesker and Collon, runs southward by Mellifont to the Boyne, forming the boundary between Louth and Meath. The northern slope of the hilly range above mentioned spreads into an open gently undulating plain, almost wholly under tillage, which extends without any remarkable eminence as far as the river of Dundalk. This level district is crossed from west to east by various streams, which, uniting as they approach the sea-coast, form three moderately sized rivers; the Dee, the Glyde, and the Fane. The Dee rises in the north-east of Meath, and passing through the town of Ardee, which is, next to Dundalk, the most considerable place in the county, proceeds in a direction nearly from west to east until within four miles of the sea, where it receives the White river, running north-eastward past Dunleer, which direction the united stream preserves through the remainder of its course. The Glyde, formed by the junction of the Lagan, which rises in Meath, with a stream descending from the Monaghan border, passes for the first five miles of its course through a bare and uninteresting tract bordering on the latter county. Eastward from this the appearance of the country rapidly improves: a series of demesnes, of which Louth Hall, the seat of the earl of Louth, is the most extensive, occupies both banks of the river for several miles of its course through the rich tract north of Ardee: the remainder of its progress to Castlebellingham, a remarkably pretty village on the great northern road leading from Drogheda to Dundalk, is through low marshy meadow lands. At Castlebellingham it turns southward, and winding through a well-improved tract bordering on the coast, meets the Dee, with which it has a common embouchure at Anagassan. The course of the Fane is nearly parallel to that of the Glyde, and the character of the country through which it runs is similar, the more highly improved portion being towards the coast, where for two miles of its course it skirts the demesne of Clermont, and then enters the sea at the village of Lurgangreen. A dead flat, beginning south of Lurgangreen, continues to Dundalk, the county town, which stands on the extreme verge of the plain, at the head of a creek formed by the embouchure of the Castletown river. The surrounding country is in a high state of cultivation: the level lands towards the sea, in particular, are laid out with great regularity and on an extended scale.

Beyond the Castletown river, which runs out of the county of Armagh in a direction from north of west to south of east, the surface is of quite a different character. A group of mountains, ranging from 1000 to 1900 feet in height, and extending over a district fifteen miles long and five miles broad, stretches across the Armagh border, and extends eastward into a great peninsula forming the northern boundary of the Bay of Dundalk and the southern limit of the Lough of Carlingford and basin of the Newry river.

The general direction of these mountains is from north-west to south-east: the group is divided into two nearly equal portions by a ravine traversing it from north to south, and forming a direct line of communication between Dundalk and Newry. Through this defile the great northern road is carried at a considerable height above the bed of a mountain-stream, which has been taken advantage of in the formation of a pretty sheet of water in the demesne of Ravensdale, a romantic seat of the late Sir Harry Godericke. The steep declivity of the mountain, which rises about 1500 feet above the level of the glen in which the mountain stands, is clothed with wood to a height of several hundred feet; and this hanging screen of foliage is prolonged on the south by a succession of similar plantations extending as far as the bay of Dundalk. A remarkable wooded eminence, called Trumpet-hill, rising between the main mountain-range and the shore, forms a prominent feature in this scene, which, to the traveller approaching Dundalk from the north, is one of peculiar variety and grandeur: this effect is considerably heightened by the bleakness and monotony of the boggy tract of Killeavy, through which the road passes for several miles before entering the defile. The mountains lying to the west of this ravine are situated chiefly in the county of Armagh, and consist of the Slieve Gullion and Forkhill groups. The latter lie immediately along the boundary of Louth, and are distinguished by the extreme ruggedness of their outline, a feature more or less characteristic of all the heights of the range. The Kilcurry river, descending from the southern declivities, joins the Castletown river a short distance above the bridge of Dundalk. The glens and vales which lie along this border of the mountain-region possess much picturesque beauty. On the eastern side of the pass of Ravensdale the chief heights are Clermont, 1462 feet; Clermont Cairn, 1674 feet; and Dorlargy, 906 feet. Trumpet-hill rises 465 feet, but from its extreme steepness appears to be much higher. From the eastern side of Ravensdale the mountains stretch back to the river of Newry and bay of Carlingford, which they overhang in masses rising almost immediately from the water's edge. The chief heights here are Corrakite, 1869 feet, and Carlingford mountain, immediately over the town of Carlingford, 1935 feet. Towards the extremity of the peninsula and along that side bounding the bay of Dundalk the mountains leave a considerable margin of level land between them and the sea. This open tract is several miles in width at the extremity of the peninsula, where it terminates in the low point of Ballagan, forming the southern boundary of the bay of Carlingford. A considerable valley, watered by two streams called the Big and Little Rivers, penetrates the mountain-region on this side, running up between the heights of Barnavave, 1142 feet, on the east, and Slieve Nagloch, 1024 feet, on the west. On the north the plain is contracted to a narrow strip along the shore of Carlingford Loch and valley of the Newry river by the mountain-group above mentioned. The town of Carlingford, a place of considerable antiquity and historical interest, stands at one extremity of this tract, and the castle of Narrow-water at the other. The latter however, being built on the opposite side of the river of Newry, is in the county of Down. The harbour of Carlingford is described under the article DOWN. The only other harbour, with the exception of a shallow creek at Anagassan, and a small fishing-pier at Clogher-head, is that of Dundalk. Clogher-head is the only bold feature of the coast between Dundalk and the mouth of the Boyne. A broad sandy beach, in some places extending at low-water to a distance of two miles, skirts this part of the coast at every other point. The danger of these great sandy shoals is however much diminished by the prevalent direction of the wind, which for nine months of the year is off shore.

Geology.—The level portion of the county south of the river of Dundalk belongs generally to the extensive clay-slate formation, which follows the northern margin of the limestone plain from the Irish channel on the east to the verge of the Upper Shannon on the west. One considerable patch of carboniferous limestone, skirted with a narrow belt of yellow sandstone and conglomerate, is included within the county boundary to the west of Ardee, and minor deposits of the same rock occur in several other localities through the west and north-west of the southern division; but the greatest extent of this formation within the county is in the district north of Dundalk, where the level space between the declivities of the mountains and the shore, from the town of Carlingford to the bridge of Dundalk, and thence westward on both sides of the Castletown river to its junction with the Kilcurry, is occupied by a limestone formation, which, as it is surrounded on the landward side by transition and primitive rocks, may probably be in connection with that part of the great central field which is known to be overlaid by the waters of the Irish Channel farther south. The structure of the mountainous region is similar to that of the group of Mourne, consisting of a nucleus of granite supporting the clay-slate and limestone of the surrounding field on its flanks; the clay-slate near the line of contact being altered, and passing into greenstone slate. A great protrusion of crystalline greenstone trap occurs at the eastern extremity of the range, constituting the central mass of the mountains between the Big River and Carlingford. On the northern declivities of these heights the clay-slate re-appears, skirting the southern shore of the bay of Carlingford. Iron and lead ore are the only minerals which have been observed, but nowhere in sufficient quantity to warrant mining operations.

Soil, &c.—The soil of the southern division of the county, although not so rich as that of the limestone plain of Meath, is well calculated for every kind of grain-crop. Wheat is grown in large quantities in the district round Ardee; oats and barley are the chief crops raised off the tillage lands of the rest of the southern district. The tract north of the bay of Dundalk, between the mountains and the sea, also produces heavy wheat crops. Farming in general is carried on in a superior manner. Green crops are grown by almost all the gentlemen farmers. The fences are usually of quick-set, and the lands well drained. In the mountain-district the condition of the people is much inferior, and the improved system of husbandry unknown. Spade-cultivation is here very general, and the old slide car without wheels is still in use. The dwellings and appearance of the peasantry inhabiting the dreary tract through which the northern road passes before entering the defile of Ravensdale contrast strongly with the comfortable habitations and decent dresses of the rural population of Down. The condition of the peasantry throughout the southern district is however considerably better in all respects than in most of the counties of Leinster. The rate of wages for agricultural labourers varies from 8*d.* to 10*d.* per day, for 210 working days in the year.

There is no regular return of the sales of grain in the several market-towns. The sales in Dundalk in 1835 were—

Wheat	242,100 cwts.
Barley	377,074 „
Oats	146,037½ „

The sale of oats at Ardee in the same year is estimated at 73,400 cwts., and at Castlebellingham 3500 cwts. The wheat and barley of the above return are chiefly the produce of Louth and Monaghan; the oats, of Cavan, Monaghan, and Fermanagh. The greater part of the oats produced in Louth is used for home consumption.

The linen manufacture is carried on with some activity at Ravensdale and Collon, where there are large bleach-greens, but chiefly in Drogheda and its neighbourhood, where the trade is generally very brisk. In Drogheda there is a steam-power mill for spinning flax, which employs 450 spinners. The quantity of linen made in the town is 1500 webs weekly, six-sevenths of which are manufactured from yarns spun in the town and neighbourhood, or imported from Belfast, and the remainder of British yarns. The number of persons employed in the linen manufacture in the county in 1831 was as follows: bleachers, 20; flax-dressers, 6; reed-makers, 2; weavers (including some woollen weavers) 972. In the same year there were in the county 6 brewers, 7 maltsters, 30 tanners, 64 coopers, 14 corn-dealers, 60 millers, and 15 millwrights. A pin manufactory was established at Drogheda, in 1836, by a Manchester house, who were unable to procure a sufficient number of hands at their English establishment. The hands employed are children, who earn about 4*s.* per week. In 1838 there were 260 employed, and the proprietors were looking out for the site of another establishment in a populous part of the county. The fisheries off the coast give occasional employment to 13 decked fishing-boats, 11 half-decked ditto, one open sail ditto, and 313 open sail-boats, having an aggregate tonnage of 1765 tons, and manned by 1315 fishermen.

There is a rather numerous resident gentry. The only nobleman permanently resident is Lord Viscount Ferrard. The Earl of Roden has a mansion and fine park adjoining Dundalk, but is usually resident in the county of Down. The other principal proprietors are Sir Patrick Bellew, Sir Allan Bellingham, Sir Richard Robinson, and the families of Fortescue, Balfour. Taaffe, Chester, &c.

Divisions, Towns, &c.—Louth is divided into the baronies of *Lower Dundalk*, on the north-east, containing the town of Carlingford, population (in 1831) 1319; *Upper Dundalk*, on the north-west, containing the town of Dundalk (pop. of borough and town 13,078); *Louth*, in the centre, containing the town of Louth (pop. 613); *Ardee* on the south-west and centre, containing the towns of Ardee (pop. 3975) and Castlebellingham (pop. 611), and the village of Anagassan (pop. 235); and *Ferrard*, in the south, containing the towns of Collon (pop. 1153), Dunleer (pop. 710), and Clogher (pop. 592), and the villages of Termonfeckin (pop. 470) and Baltray (pop. 428).

Dundalk, the assize town of the county, has had various charters of incorporation. The governing charter bears date the 4th March, 1674. The corporation consists of a bailiff, 16 burgesses, and an indefinite number of freemen. The governing body is the corporation at large. The freedom is acquired by special favour of the governing body. There is no criminal jurisdiction beyond that of a justice of the peace, which rank, for the borough, the bailiff and recorder hold *ex-officio*. The court of record is disused. The average revenue is 80*l.* per annum, and the expenditure 150*l.* The corporation in 1835 were 1126*l.* 10*s.* in debt. The patron is the Earl of Roden, who is proprietor of almost the entire site of the town. The present boundary of the borough comprises an area of 445 statute acres.

Prior to the Union, Dundalk returned two members to the Irish parliament. It is now represented by one member in the imperial parliament. The right of election formerly lay with the corporation. It is now, by the 2nd Wm. IV., c. 88, vested in the resident freemen and 10*l.* householders. The number of voters at the last general election was 376.

Dundalk is a place of a very remote antiquity, being the *Dundalgan* of the Irish Ossianic poems, the residence of the hero Cuchullin. It is extremely probable that some earthen and stone works in the neighbourhood of the present town formed a portion of the old *cahir* or city. The situation of the place, on the lowest ford of the Castletown river, in the direct road to Ulster, rendered it early a port of importance to the English. It was here O'Hanlon opposed the march of De Courcy northward in 1179, on which occasion a great number of the Irish were drowned in the fords. The result of the battle was doubtful, but Dundalk remained in the hands of the English. The site and vicinity of the town were afterwards bestowed on Bertram de Verdon, to whom probably the present town owes its origin. On Edward

Bruce's invasion of Ireland in 1315, Dundalk was among the first places that fell into his hands, and here in the succeeding year he caused himself to be crowned king of Ireland. Bruce, after ravaging the south of Ireland with various fortune, returned to the neighbourhood of Dundalk in the latter end of the year 1318. Here he was encountered at the Faughart, a height on the northern side of the Castletown river, by Lord John Bremingham. In this battle Bruce was slain, and his predatory army entirely dispersed. Bremingham for his services was created earl of Louth, and had the manor of Ardee bestowed on him. During the rebellion of Shane O'Neill, in the reign of Elizabeth, Dundalk was besieged by the insurgents, but without success. On the breaking out of the rebellion of 1641, Sir Phelim O'Neill took it without opposition, the garrison having surrendered on the first summons. On the 26th of March, 1642, Lord Moor and Sir Henry Tichbourne, after having driven the Irish from before Drogheda, and retaken Ardee, advanced against Dundalk, which after some resistance they carried by storm, having broken open the main gate with pickaxes. After the capture of Drogheda by Cromwell in 1649, Dundalk surrendered to the parliamentarians. In the war of the Revolution it was evacuated by the forces of James II. on the advance of the army of King William, who took possession of it before he proceeded to the Boyne.

The main street of Dundalk is built along the line of the great northern road, and runs nearly north and south: the other leading streets run eastward from the main street, and parallel to one another, occupying the extreme verge of the plain along the southern bank of the creek, where the Castletown river expands into the sea. At the northern extremity of the main street is the bridge, and south from it the linen-hall and church. The market-house, a decent brick building, and the county-court house, a very handsome edifice of cut stone, are situated nearly in the middle of the main street. The county infirmary, a brick building in the Tudor style, stands at its southern extremity. The demesne of Dundalk-house, a residence of the earl of Roden, skirts the western side of the main street through its entire length. An extensive cavalry barrack terminates the town eastward. The general appearance of Dundalk is highly respectable. The provisions of the lighting and paving act were put in force here in 1832. The amount of the assessment for lighting, paving, and watching for the year 1836 was 696*l* 8*s*. 11*d*.

The corn-trade is very extensively carried on. In the town are a steam-power mill for grinding wheat, a large distillery, and two breweries. Dundalk is the chief point of export for the counties of Cavan, Monaghan, and Fermanagh. The exports of agricultural produce in 1835 consisted of

	Cwts.
Wheat	142,097
Wheat, meal, and flour . .	16,280
Barley	56,280
Malt	53,875½
Oats	229,542¼
Oatmeal	129,260

There is also a large export of butter and eggs, collected principally from the counties of Monaghan, Cavan, and the northern parts of Longford. The butter exported is about 550 tons for the season: the number of eggs exported in 1835 was 2,410,800; of yards of linen 60,000; of lbs. of wool 15,680; of heads of cows and oxen 3932; of horses 100; of sheep 7266; and of swine 48,183. Total value of the exports for that year 452,813*l*. In the same year the imports amounted to 107,953*l*., of which the chief items were for coal, culm, and cinders 19,021*l*.; cotton manufactures 13,800*l*.; woollen manufactures 10,500*l*.; haberdashery 6500*l*.; iron 8960*l*.; fish (herrings) 7000*l*.; oakbark for tanners 4,800*l*.; sugars 2100*l*.; and teas 1400*l*. Two steam-vessels, each of 200 tons register, the property of a Dundalk company, ply regularly between the port and Liverpool. Since the establishment of these, there has been a considerable increase in the amount of imports. The port, although it has not much depth of water, is considered a safe one. A freight will be taken for it in an English port at a less charge than for either of the ports of Newry or Drogheda. There are no harbour dues.

Dundalk is the head of an excise district, embracing Newry and Warrenpoint in the county of Down, Ardee in Louth, and the entire county of Monaghan. The amount of excise paid in the district in 1835 was 112,189*l*. 18*s*. 7¾*d*. The customs paid for the port of Dundalk, in the same year, amounted to 3598*l*. 5*s*. 7*d*. A branch of the bank of Ireland is established here.

Ardee is an antient corporation, at present governed by charter of the 28th of February, 1712. The corporation consists of a portreeve, burgesses, and freemen. The governing body is the common-council. There is no criminal jurisdiction beyond that of the portreeve, who is a justice of the peace *ex officio* within the borough. The civil court of the recorder is now disused. It is asserted by the inhabitants that corporate estates to the value of 1000*l*. per annum have been spoliated. The present income of the corporation is 125*l*. [ARDEE.]

Dunleer is incorporated by charter of the 3rd of August, 1678. The corporation is virtually extinct. The town itself is inconsiderable.

Carlingford is an antient corporation, having been, during the existence of the English pale, a place of considerable importance, as commanding the only pass at that time practicable between Dundalk and Newry. The governing charter is dated 19th of August, 1619. The corporation is virtually extinct.

Prior to the Union, Louth returned two county members and two for each of the above boroughs. The representation is now limited to two county members, and one for Dundalk. The county constituency, at the end of 1836, consisted of 1194 voters. On the 1st of January, 1836, the police force of the county consisted of 4 chief constables, 22 constables, 107 subconstables, and 5 horse of the constabulary, supported at a cost of 5121*l*. 13*s*. 5*d*., of which 2469*l*. 18*s*. 8*d*. was chargeable against the county; and of 1 magistrate, 21 constables, 70 subconstables, and 2 horse of the peace-preservation police, the cost of supporting which establishment was 4400*l*. 16*s*. 5*d*. In the same year the total number of persons charged with criminal offences who were committed to the county gaol was 321, of whom 288 were males and 33 females. Of these 91 males and 4 females could read and write at the time of their committal, 137 males and 20 females could read only, and 60 males and 9 females could neither read nor write. The assizes for the county are held at Dundalk, and general quarter-sessions at Dundalk, Drogheda (a county in itself), and Ardee, in which last place is a court-house and bridewell. The district lunatic asylum is at Dublin. This asylum was originally built in the year 1815, by parliamentary grant, for admission of all pauper lunatics throughout Ireland. It was created a district asylum by act of 11 Geo. IV., c. 22, and is now annexed to the district formed by the counties of Wicklow, Dublin, Meath, Louth, and the counties of the city of Dublin and of the town of Drogheda. The county infirmary at Dundalk is a very extensive and complete establishment. There are dispensaries in all the minor towns. There is no local newspaper.

Population.

Date.	How ascertained.	Houses.	Families.	Families chiefly employed in agriculture.	Families chiefly employed in trade, manufactures, and handicraft.	Families not included in the preceding classes.	Males.	Females.	Total.
1792	Estimated by Dr. Beaufort .	11,545	..	..	..	..	..	..	57,750
1821	Under Act 55 Geo. III., c. 120	18,138	19,891	..	..	..	49,363	57,648	101,011
1831	Under Act 1 Will. IV., c. 19	18,834	19,811	12,028	3,970	3,813	52,439	55,042	107,481

Louth, at the coming of the English, formed a portion of the territory of Orgial or Oriel, by which name it afterwards came itself to be known in contradistinction to the more western parts of the territory. The native families of chief authority in the territory at this time were the O'Kervaills, or O'Carrols, and the MacMahons. Donchad O'Kervaill, prince of Orgial, was the founder of several religious houses in the present county of Louth, about the middle of the twelfth century: among these was the Cistercian abbey of Mellifont, the consecration of which, in A.D. 1157, was attended by a great assemblage of the Irish nobility. Among those who bestowed gifts on the new establishment on that occasion was Devorgilla, wife of O'Rourk, whose elopement with Dermot MacMorrogh shortly after led to the English invasion. The eastern part of Orgial, constituting the present Louth, having been conquered by De Courcy between 1179 and 1180, was erected into a county by King John, A.D. 1210. Being at the time accounted a portion of Ulster, it formed part of the grant to De Courcy, and after his time to De Lacey, by whom it was divided among inferior barons. The families of De Verdon, Pippard, Taaffe, Bellew, and Gernon were among those introduced at this period. During the decay of the English authority, in the fourteenth and fifteenth centuries, Louth remained attached to the government. The preservation of the county from the general spirit of defection then abroad was owing, in a great measure, to the institution, by act of the 12th Edw. IV., of the Brotherhood of St. George, a military fraternity composed of thirteen of the chief nobility and gentry of the counties of Kildare, Dublin, Meath, and Louth, and having for its object the protection of the pale from the neighbouring Irish, and the arrest of outlaws and rebels within the above counties. The subsequent history of Louth, which was not considered a portion of Leinster until the reign of Elizabeth, is in great measure that of Drogheda and Dundalk. [DROGHEDA.] The forfeitures consequent on the rebellion of 1641 and the ensuing civil wars extended over nearly the entire county. Those which followed the war of the Revolution of 1688 embraced 22,508 acres, of an estimated value, at that time, of 82,310*l*, 3*s*.

The numerous antiquities which occur throughout Louth have been made the subject of a volume entitled 'Louthiana,' published at Dublin in 1758. Earthen mounds and entrenchments are of very frequent occurrence. The most remarkable in the county is that of Castle-Guard at Ardee. Its perpendicular height is nearly 90 feet, the depth of the main trench between 30 and 40, the circumference at the top 140, and round the base upwards of 600 feet. The mound and building called *Fahs na ain Eighe*, or 'the one night's work,' near Dundalk, is a curious combination of the earthen *rath* with the stone *cashiol*, and is probably coeval with the Dundelgan of the Ossianic romances. Stone circles and other supposed Druidic remains are also numerous. The most remarkable are at Ballirckan and Ballinahatry, near Dundalk. At Ballymascanlan is a cromlech, the covering-stone of which measures 12 feet by 6, and weighs upwards of thirty tons. Round towers formerly stood at Louth and Drogheda, and two are still remaining at Dromiskin and Monasterboyce. The last is one of the finest specimens in the kingdom: it is 110 feet high, but has lost the greater part of its conical covering. In the churchyard near the tower stand two beautifully sculptured stone crosses. The larger, called St. Boyne's Cross, is 18 feet high. On the base of the smaller, which is 16 feet in height, is an inscription, on which 'Pray for Muredoch' is legible in very antient Irish characters. The arms of these crosses are enclosed in circles, and the entire surface of each is covered with rich tracery and allegorical sculpture. St. Boyne is probably a corruption of the name of St. Buas, the founder, who died A.D. 521. Muredoch, by whom the other cross was probably set up, died A.D. 836. The ruins of the abbey of Mellifont occupy a beautiful site on the bank of the Mattock river, near the Boyne. They consist of a gate-tower, part of a chapel, and the lower story of an octagonal chapter-house. The ornamental part of the doorways and arches of the two latter buildings are formed of blue marble, and have been highly gilt. There are some very antient ruins on the hill of Faughart, where Edward Bruce is said to be buried, connected with the old cell of St. Brigid. Of the various feudal buildings throughout the county the chief are the castle of Carlingford, erected by King John, Rohe's Castle, north-west of Dundalk, Torfeckan or Termonfeckin Castle, a residence of the archbishops of Armagh, inhabited last by Primate Ussher, and Castletown, still kept in habitable order, on the south bank of the Castletown river near Dundalk.

Louth lies partly in the diocese of Clogher, but chiefly in that of Armagh, which extends into the counties of Armagh, Londonderry, Tyrone, Louth, and Meath. The number of parishes in this diocese is 98, constituting 88 benefices, and having 88 churches of the Establishment, 11 other places of Protestant worship in connection therewith, 68 Presbyterian meeting-houses, 44 meeting-houses belonging to other Protestant Dissenters, and 120 Roman Catholic chapels. In 1834 the total population of the diocese was 500,636, of whom there were 103,012 members of the Established Church, 84,837 Presbyterians, 3340 other Protestant Dissenters, and 309,447 Roman Catholics, being in the proportion of 3 Roman Catholics to 1·88 Protestant, of whatever denomination. In the same year there were in this diocese 623 daily schools, in which 44,606 young persons received instruction; being in the proportion of 8·10 per cent. of the entire population under daily tuition, in which respect Armagh stands fourteenth among the 32 dioceses of Ireland. Of the above schools, in 1834, there were sixty-seven in connection with the National Board of Education.

The county expenses are defrayed by grand-jury presentments. The amount levied for the year 1835 was 11,247*l*. 2*s*. 8*d*., of which 2749*l*. 14*s*. 7*d*. was for roads and bridges, 4509*l*. 6*s*. 10*d*. for buildings, salaries, charities, &c., and 3988*l*. 1*s*. 3*d*. for police.

(Wright's *Louthiana*; *Report of the Railway Commissioners for Ireland*; Cox's *History of Ireland*; *Parliamentary Reports and Papers*, &c.)

LOUTH. [LINCOLNSHIRE.]

LOUTHERBOURG, PHILIP JAMES DE, a distinguished landscape painter, born at Strasburg, October 31, 1740, was the son of a miniature painter who died at Paris in 1768. He at first studied under Tischbein, afterwards under Casanova, whose name as an historical painter was then in great vogue. While his own peculiar forte lay in landscape, he was enabled by his education to give to that branch of the art a greater compass and range of subjects than usual, as in his various battle and hunting pieces, besides others that claim to be considered as strictly historical in subject; for instance, his 'Storming of Valenciennes' and 'Lord Howe's Victory in June, 1794.' His works are stamped by great vigour and mastery of pencil, and by excellent management in regard to composition. After having obtained considerable reputation at Paris by the works which he exhibited at the Louvre, and having been admitted a member of the Academy there in 1768, Loutherbourg came over to England (where he was afterwards elected a royal academician) in 1771, and was engaged as scene-painter at the Opera House. His vigorous style of execution, his poetical imagination, and his perfect knowledge of scenic effect, well qualified him for a department of art which demands them all, and which is held to be a subordinate one chiefly because its productions are soon laid aside and entirely forgotten. Soon after his settling in this country, Loutherbourg got up, under the name of the *Eidophusikon*, a novel and highly ingenious exhibition, displaying the changes of the elements and their phenomena, in a calm, a moonlight, and a sunset and a storm at sea. Of this very interesting pictorial contrivance, which may be said not only to have anticipated, but in some respects to have surpassed our present dioramas, although upon a smaller scale, a tolerably full account is given in Pyne's 'Wine and Walnuts.'

Loutherbourg etched several of his own compositions. He died at his residence at Hammersmith-terrace, March 11, 1812.

LOUVAIN (the French name of *Leuven*), a very antient town in South Brabant, in 50° 54′ N. lat. and 4° 39′ E. long. It stands on the Dyle, 16 miles east from Brussels, and about the same distance south-east from Mechlin, or Malines, and north-west from Tirlemont. The system of railroads from Ostend, Bruges, Ghent, Antwerp, and Brussels, which unite at Malines, is continued through Louvain and Tirlemont to Liege, and will be further continued through Aix-la-Chapelle to Cologne, and eventually to Bonn, where its further progress will be impeded by natural difficulties. Louvain was surrounded by walls in 1156, and was for a long time the residence of the dukes of Brabant. In those times Louvain was the largest, the richest, and the most commercial city in the country. Its principal trade consisted in woollen manufactures, which are said to have been prosecuted to such an extent at the beginning of the fourteenth century as to give employment to 150,000 workmen; but this number appears to be exaggerated. The weavers, in 1382, revolted against the duke of Brabant, and for a time desolated the province, but were speedily reduced to obedience; and the ringleaders being exiled, the greater part of them came to England, where they introduced the manufacture of broad-cloth. The walls of Louvain are nearly seven miles in circumference; but a great part of the space enclosed is no longer occupied by houses, which have been succeeded by gardens and vineyards. The population is now about 27,000, or only one-sixth of what it was 500 years ago.

The manufacture of woollens and lace is now carried on in Louvain to a small extent. There are several breweries in the town, and the beer of Louvain enjoys a high reputation, and has a great sale in other parts of Belgium. There is also a trade to some extent in agricultural produce.

The university of Louvain was established in 1426 by John, the fourth duke of Brabant, and long enjoyed a high celebrity. It was suppressed by the French in 1793, and the building converted into an hospital, but was restored in 1817, and is again a flourishing institution with 60 professors and 500 students: it has a botanic garden and zoological and mineralogical museums.

The town-hall, which is a fine Gothic building, erected in 1440, contains some good paintings. The church of St. Peter is one of the finest religious edifices in Belgium; the tower, which fell down in 1604, is said to have been 533 feet high. The town is in general not well built.

LOUVIERS, a town in France in the department of Eure, is on the river Eure, and on the road from Evreux to Rouen, 12 miles from Evreux and 17 from Rouen. This town was antiently fortified. In the religious wars of the sixteenth century the townsmen embraced the party of the League, and afforded an asylum to the parliament of Rouen, when driven out of the city by the Protestants; but they submitted to Henri IV. after the battle of Ivry. The town is handsomely built, and situated in a fertile plain: it has an antient church of Gothic architecture, and promenades round the site of the ramparts. The population in 1831 was 8627 town, or 9885 for the whole commune; in 1836 it was 9927 for the commune. The chief manufacture is of fine woollen cloths and kerseymeres, first introduced in 1681, and now the most important of the kind in France: there are upwards of forty factories. Other woollen goods also are made. There are mills for spinning woollen, linen, and cotton yarn, moved by water; there are also dye-houses for cotton and wool, linen-bleaching establishments, tan-yards, soap-houses, sugar-refining houses, and workshops for making the machinery employed in the various factories and mills. There are a subordinate court of justice, several government offices, a public library, and a theatre. There are four yearly fairs. The fine cloths are sent chiefly to Paris; the remainder are exported. The wool is chiefly brought from Spain. The arrondissement of Louviers contains 302 square miles, and is divided into five cantons and 118 communes. It had a population of 68,942 in 1831; and of 69,402 in 1836.

LOUVRE. [Paris.]

LOVE-APPLE, a fruit-bearing annual, also called Tomato, is the Solanum Lycopersicon of botanists, a plant much cultivated for the sake of its berries, from which are obtained various preparations used for culinary purposes. It is a native of Peru and Brazil, whence it has been carried into North America and the Old World; and it has become, as it were, naturalized in some parts of India. The common love-apple has depressed round lobed irregular berries, varying in size from one to three or four inches in diameter, and in colour from dull red to yellow. When raw they have a singular flavour, not unlike that of cooked meat, but they are never brought to table except stewed or in the form of sauce. The only directions for the cultivation of the Tomato which it is necessary to give are, that it should be treated like a tender annual, and when planted out have a southern bank or wall, or some trellis, over which the branches may be disposed. In this climate the summers are too short to ripen the fruit unless assisted by reflected heat. Many varieties are known, which some botanists consider distinct species; they principally differ in the form, colour, and size of their fruit. They all are at variance with the usual character of the genus Solanum, in having a fruit with an irregular number and arrangement of its cells, on which account they have been collected by Dunal into a particular genus, to which he gives the name of Lycopersicon, distinguishing eleven species, and calling the common garden love-apple *L. esculentum*.

LOW COUNTRIES, or NETHERLANDS, a district in the north of Europe, lying between 49° 30′ and 53° 40′ N. lat., and between 2° 40′ and 7° 10′ E. long., comprehending the kingdoms of Holland and Belgium, and grand-duchy of Luxemburg. It is bounded on the east by the Rhenish provinces of Prussia and the kingdom of Hanover, on the north and the west by the North Sea, and on the south by the kingdom of France.

LOWER GREEN-SAND. [Cretaceous Group.]

LOWTH, WILLIAM, born 1661, died 1732, the elder of two divines of the Church of England, father and son, both distinguished by eminent attainments in biblical literature and by their useful publications. The elder is the less eminent, though he is supposed to have been the profounder scholar; but he lived less in the public eye, and attained to none of the dignities which were bestowed on the son. Early in life he became chaplain to Mew, bishop of Winchester, who gave him a prebend in the cathedral of Winchester, and the rectory of Buriton in that diocese, where he lived, died, and was buried. He had been a pupil of Merchant Taylors' School, from whence he had passed to St. John's College, Oxford.

If we would form an idea of the extent of his laborious reading, we must look rather to the works of other persons than his own, and particularly to Potter's edition of the works of Clemens Alexandrinus, and Hudson's edition of the works of Josephus. To both these editors he communicated valuable notes. Of his own writings, those which are now most read are his 'Directions for the Profitable Reading the Holy Scriptures,' which was first published in 1708, and has been often reprinted, and his 'Commentary on the four greater Prophets.' This last-named work usually accompanies Bishop Patrick's Commentary on the other books of Scripture, to which it was prepared as a supplement.

LOWTH, ROBERT, born 1710, died 1787, a prelate of the English Church, son of the Lowth last named, and, like his father, distinguished by his knowledge of the books of Scripture and his valuable writings in the illustration of them. He was also an elegant scholar, and an inquirer into minute and curious history. There are a few poems of his, chiefly in the nature of academical exercises, which in their day were greatly admired.

He was educated in the school of Winchester founded by William of Wickham, from whence he passed to New College, Oxford, which was also founded by the same munificent prelate. He went abroad with members of the Dartmouth and the Devonshire families, who, especially the latter, favoured his advancement in the church; and having the good fortune to secure also the patronage of Hoadly, bishop of Winchester, he rose by regular gradations till he became bishop of London, and in a situation to decline the offer which was made to him by King George III. of the archbishopric of Canterbury. A few dates of his preferments may suffice. Early in life he had the rectory of Ovington; in 1750 he was made archdeacon of Winchester; in 1753 rector of East-Woodhay in that diocese; in 1766 he became bishop of St. David's; in the same year he was translated to Oxford; and in 1777 was made bishop of London.

In speaking of the writings with which Bishop Lowth has enriched the literature of his country, we shall pass over his minor tracts, even those which belong to his controversy with Bishop Warburton, arising out of a trifling difference of opinion respecting the Book of Job. The controversy was conducted on both sides with a virulence rarely witnessed in these days in the disputes of literary men, and the pamphlets may be recommended to any one who can relish angry disputations seasoned by learning and wit. Writings on which we can dwell with greater satisfaction are his 'Life of William of Wyckham,' first published in 1758, an admirable specimen of the results to be attained by curious and recondite biographical research; and his 'Lectures on the Poetry of the Hebrews,' which were delivered by him in the University when he was professor of poetry. These lectures may be said to have opened an almost new subject, little attention having been previously paid to the laws of Hebrew poetry, or even to the fact that large portions of the books of the Old Testament are poems, in the strict and proper sense of the word, though presented to the English reader in a mere prose version, and as if there was no difference between them and the parts of those Scriptures which are really prose. They were received, when published, with great respect by the learned, not of England only, but of the Continent, where they were reprinted, with a large body of valuable notes by the learned biblical scholar J. D. Michaelis. These lectures were published by Lowth in Latin, the language in which they were delivered, but there is an English translation of them by Dr. Gregory, published in 1787. In 1778, the year after he was promoted to the bishopric of London, he published a 'Translation of the Prophet Isaiah,' distinguishing the poetical from the parts written in prose, and exhibiting the various forms of Hebrew parallelisms which occur in that prophet, and which he had explained and illustrated in his lectures. He gave a large body of valuable notes. These were his greater works; but he published also an 'Introduction to English Grammar,' which was thought valuable at the time, and was often reprinted, but is now nearly superseded and forgotten.

A volume containing memoirs of his life and writings was published soon after his decease.

LOXA, or **LOJA**, a town of Spain, in the province of Granada, 30 miles west of Granada and 40 north-east of Malaga, at the north base of a ridge of hills and in a valley watered by the river Genil. It has manufactories of printed cottons and paper, three parishes, a clerical college, two hospitals, and 13,000 inhabitants. The territory is fertile and well watered, and produces corn, maize, pulse, oil, and abounds in oak-trees. (Miñano.)

LOXI'ADÆ, Mr. Vigors's name for a family of birds placed by him as the extreme of the tribe of *Conirostres*, which is the third tribe of his *Insessores*, or perching birds, and intervenes between the *Dentirostral* and *Scansorial* tribes in his system.

Mr. Vigors remarks, that notwithstanding their inferiority of size, some species of the family may be observed to equal even the *Hornbills*, allowance being made for their relative proportions, in the extreme enlargement of the bill. 'The curved and serrated bill of the latter family' (*Hornbills*), says Mr. Vigors, 'perceptibly shortening itself, as we have perceived in *Momotus*, is still carried on to a corresponding group in the present, the *Phytotoma*, Gmel., where these characters are preserved, though the curve is slighter and the serration less strong. United to that genus by some intermediate but uncharacterised species, the *Coccothraustes*, Briss., conducts us to several groups, among which *Pitylus*, Cuv., *Strobilophaga*, Vieill., the true *Loxia* of authors, and *Psittirostra*, Temm., may be distinguished; from whence we pass to the shorter-billed groups, among which *Colius*, Linn., and *Cissopis*, Vieill., may be particularised. These are but few of the natural genera which abound in this extensive family. Many intervening species, possessing strong genuine distinctions, may be introduced among these groups, which at length terminate in some of the shorter and stronger-billed species of the Linnean *Tanagers*. These, it will be remembered, commenced the present tribe (*Conirostres*) by their union with the *Fringillidæ*: and thus here also the circular succession of affinities extends uninterrupted through the whole subdivision.' ('Natural Affinities that connect the Orders and Families of Birds,' *Linn. Trans.*, vol. xiv.)

Mr. Swainson (*Classification of Birds*) appears to reject the family altogether; for we find *Phytotoma* among the *Phytotomina*, a subfamily of *Musophagidæ*; *Coccothraustes* under the subfamily *Coccothraustinæ*; *Pitylus* under the subfamily *Tanagrinæ*; *Strobilophaga* under the 'Generic names not adopted;' *Loxia* and *Psittirostra* in the subfamily *Pyrrhulinæ*; *Colius* in the subfamily *Colinæ* (family *Musophagidæ*); *Cissopus* (Cissopis) cancelled; and the *Tanagers* under the subfamily *Tanagrinæ*; the subfamilies, with the exception of the two placed under the *Musophagidæ*, being arranged under the family *Fringillidæ*. Mr. Swainson's *Conirostres* (his second tribe of *Insessores*) consist of the families *Corvidæ*, *Sturnidæ*, *Fringillidæ*, *Musophagidæ*, with their subfamilies, and *Buceridæ*.

Having given the reader a sketch of the views of the ornithologists above quoted, we shall confine ourselves in this article to Brisson's genus *Loxia* only, of which M. Temminck remarks that its characters exclude all other species, being proper to the *Crossbills* only. Illiger, he observes, *in his Prodromus* is also of this opinion.

Loxia. (Crossbill.)

Generic Character.—Bill moderate, strong, very much compressed; the two mandibles equally curved, hooked, and the elongated points crossing each other. *Nostrils* basal, lateral, rounded, concealed by hairs directed forwards. *Feet* with three toes before and one behind, anterior toes divided. *Wings* moderate, the first quill longest. *Tail* forked.

M. Temminck, who gives the above generic character, records two species, *Loxia Pytiopsittacus* and *L. curvirostra*, in his second edition (1820), and *L. leucoptera*, in his third part of that edition (1835). The same three species, the first under the name of *L. pinetorum*, are recorded by Mr. Swainson.

Geographical Distribution of the Genus.—The north both of Europe and America. One species however, *L. curvirostra*, is found in Japan as well as in Europe.

Example, *L. curvirostra*, the *common Crossbill.*

Before we go into the history of this species, it will be well to call the reader's attention to the curious organization of the *bill* in this genus. Buffon, who, as we have too often been obliged to repeat, frequently saw deformity where all was harmony and symmetrical adaptation, does not lose this opportunity of misconstruing what he did not clearly understand. He speaks of the bill in these birds as an error and defect in nature—a deformity. If he had ever kept these birds in a cage, he would soon have found that no instrument could have been better adapted to the work required of it; and if they had ever visited his orchards he would have been convinced to his cost of its efficacy in splitting fruits for the purpose of getting at the kernels.*

Mr. Yarrell has well illustrated the structure and moving power of this organ, which, conjoined with the peculiar tongue, will be found a most perfect and beautiful piece of mechanism for attaining the end in view.

'The beak of the Crossbill,'† writes the author last mentioned, 'is altogether unique in its form; the mandibles do not lie upon each other with their lateral edges in opposition, as in other birds, but curve to the right and left, and always in opposite directions to each other. In some specimens the upper mandible is turned to the right, the lower mandible curved to the left; in others, the position of the mandibles is reversed as to their direction. In the specimen I examined the upper mandible curved downwards and to the left, the under portion turned upwards and to the right. When holding the head of this bird in my fingers, I found I could bring the point of the under mandible in a line underneath and touching the point of the upper, but not beyond it towards the left side; while on its own side the point passed with ease to the distance of 3-8ths of an inch. The upper mandible has a limited degree of motion on the cranium, the superior maxillary and nasal bones being united to the frontal by flexible bony laminæ.'

Mr. Yarrell then proceeds to the details of the anatomy, which he illustrates by the seven figures copied below. He first notices the peculiarity of the form, as well as of the magnitude of the processes of some of the bones of the head in this bird, and points out that the pterygoid processes of the palatine bones are considerably elongated downwards (*fig.* 3, *a*) to afford space for the insertion of the large pterygoid muscles. The os omoideum (*fig.* 3, *b*) is strongly articulated to the os quadratum (*fig.* 3, *c*), affording firm support to the moveable portion of the upper mandible. The jugal bone (*fig.* 3, *d*, *d*) is united to the superior maxillary bone in front, and firmly attached by its posterior extremity to the outer side of the os quadratum. Thus, when the os quadratum is pulled upwards and forwards by its own proper muscles, the upper mandible is elevated by the forward pressure of that bone.

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* Buffon, after noticing the deformity, remarks that it is 'cette espèce de difformité qui seule distingue cet oiseau du gros-bec,' &c.; 'car il est l'unique qui ait ce caractère ou plutôt ce défaut; et la preuve que c'est plutôt un défaut, une erreur de nature, qu'un de ses traits constans c'est que le type en est variable,' &c.; and yet he was aware of the use which the bird makes of it, in part at least; for he further says, 'Mais comme il n'existe rien qui n'ait des rapports et ne puisse par consequent avoir quelqu' usage et que tout être sentant tire parti même de ses défauts; ce bec difforme, crochu en haut et en bas, courbé par ses extrémités en deux sens opposés, paroit fait exprès pour détacher et enlever les écailles des pommes de pin et tirer la graine qui se trouve placée sous chaque écaille.' Buffon then describes how the operation is performed, and adds, 'On lui verra exécuter cette manœuvre en suspendant dans sa cage une pomme de pin mure:' for this he quotes Frisch, and goes on to notice the use of the bill made by the bird in climbing about the cage. He does not however appear to have kept the Crossbill so confined himself, or he would hardly have called it 'plus bête que les autres oiseaux,' nor should we have found in his index 'sa stupidité,' nor in his text 'Il n'a nulle impatience dans la captivité.'

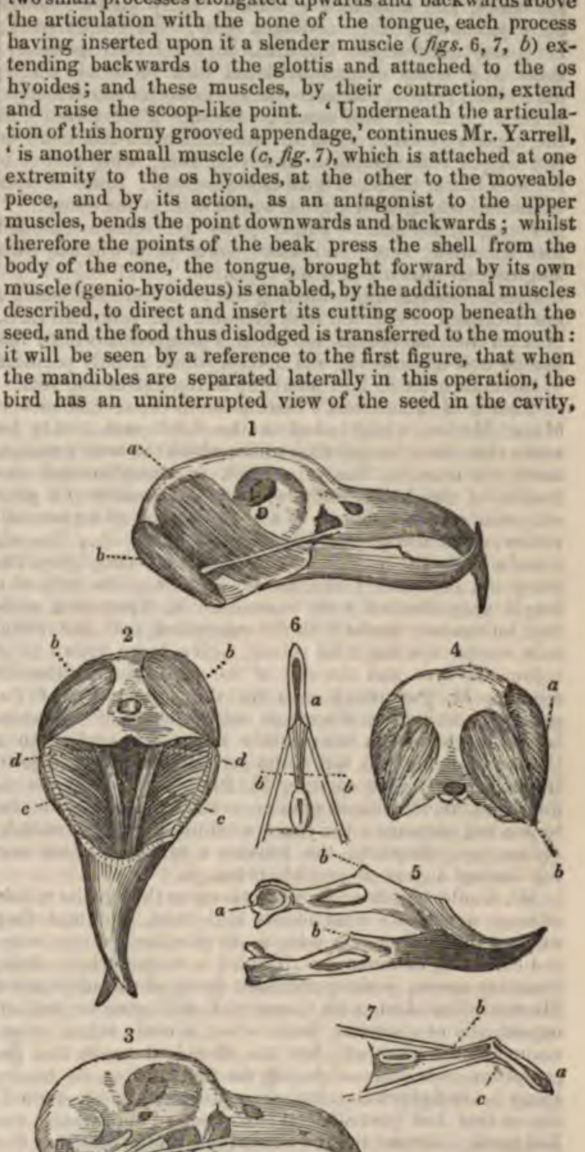
† Loxia curvirostra.

In most other birds the inferior projecting process of the os quadratum, to which the lower jaw is articulated, is somewhat linear from before backwards, and compressed at the sides, permitting vertical motion only upwards and downwards; but in the crossbill these processes are spherical (*fig.* 3, *c*), and the cavity in the lower jaw destined to receive the process is a circular cup (*fig.* 5, *a*): from the union of these two portions there results an articulation with all the motion and flexibility of the mechanical ball and socket joint.

The lower jaw is very strong and the sides or plates are elevated; the coronoid processes (*fig.* 5, *b*, *b*) are prominent, and to these, as well as to the whole outer side of the plates, the temporal muscle is attached. In a head of this bird which had been divested of all the soft parts, Mr. Yarrell found that, on sliding the lower jaw laterally upon the other, as performed by the bird, before the coronoid process is brought into contact with the pterygoid process on its own side, the extreme points of the mandibles were separated laterally to the extent above-mentioned (3-8ths of an inch).

The right side of the head was that to which the lower jaw inclined in the specimen examined by Mr. Yarrell, and on that side the temporal and pyramidal muscles were considerably larger than those on the left (*figs.* 1, 2. 4, *a*, *b*), indicating by their bulk the great lateral power which the bird is capable of exerting. The pterygoid muscles (*fig.* 2, *c*, *c*), on each side were unusually large, the great distance to which the articulated extremities of the lower jaw were removed affording ample space for them, and as the food of the bird consists of small seeds, a narrow pharynx is sufficient for the purposes of deglutition. For depressing the lower mandible three muscles are called into action; but only one of these, the great pyramidal (*figs.* 1, 2, 4, *b*), which covers two other small ones, the triangular and square muscles, is visible. All three have their origin on the occipital portion of the cranium, and are inserted by strong tendons on the under and back part of each extremity of the lower jaw, behind the centre of motion; they consequently, by their simultaneous contraction, raise the point to which they are attached, and depress the anterior part of the mandible. The lower parts of the ossa quadrata are pushed rather forwards by this compression, with the help of two small muscles (not figured), but whose situation may be explained by a reference to *fig.* 3. One of these, a small flat muscle, arises from the septum of the orbits behind the small aperture in the septum, and passes downwards for insertion upon the projecting styloid process of the os quadratum; the second is a small pyramidal muscle, arising also from the septum, anterior to the other muscle; and, passing downwards and backwards, is inserted upon the os omoideum: both these, when they contract, pull the os quadratum forwards, and so elevate the other mandible. Thus the depressors of the lower jaw, and the elevators of the upper jaw, act together to separate the mandibles. To close them, the temporal and pterygoid muscles elevate the lower jaw, assisted by the slender slips (*fig.* 2, *d*, *d*), which, extending forwards to the superior maxillary bones, act in concert by bringing them down. To work the lateral motion, the great pyramidal muscle on the right side pulls the extremity of the lower jaw, to which it is attached, backwards, the pterygoid muscles of the left side at the same time powerfully assisting by carrying that side of the lower jaw inwards.

Mr. Yarrell then quotes Mr. Townson, to show the adaptation of these parts to the wants of the bird in feeding. 'The great pine-forests, such as the Hartz in Germany,' says Mr. Townson, 'are the natural places of residence of the Crossbeaks, and the seed of the cones of these trees their food; and it is to pull out the seeds from between the squamæ, or scales of the cones, that this structure is given them. Their mode of operation is thus:—they first fix themselves across the cone, then bring the points of the maxillæ, from their crossed or lateral position, to be immediately over each other. In this reduced compass they insinuate their beaks between the scales, and then opening them, not in the usual manner, but by drawing the inferior maxilla sideways, force open the scales or squamæ.' It is at this stage of the proceeding, observes Mr. Yarrell, that the aid of the tongue becomes necessary; and here again we have another instance of beautiful adaptation. There is articulated to the anterior extremity of the os hyoides, or bone of the tongue, an additional portion, formed partly of bone, with a horny covering (*figs.* 6, 7, *a*). This is narrow, and about ⅜ths of an inch in length, extending forwards and downwards, with the sides curved upwards, and the distal extremity shaped like a scoop somewhat pointed and thin on both edges, the proximal extremity ending in two small processes elongated upwards and backwards above the articulation with the bone of the tongue, each process having inserted upon it a slender muscle (*figs.* 6, 7, *b*) extending backwards to the glottis and attached to the os hyoides; and these muscles, by their contraction, extend and raise the scoop-like point. 'Underneath the articulation of this horny grooved appendage,' continues Mr. Yarrell, 'is another small muscle (*c*, *fig.* 7), which is attached at one extremity to the os hyoides, at the other to the moveable piece, and by its action, as an antagonist to the upper muscles, bends the point downwards and backwards; whilst therefore the points of the beak press the shell from the body of the cone, the tongue, brought forward by its own muscle (genio-hyoideus) is enabled, by the additional muscles described, to direct and insert its cutting scoop beneath the seed, and the food thus dislodged is transferred to the mouth: it will be seen by a reference to the first figure, that when the mandibles are separated laterally in this operation, the bird has an uninterrupted view of the seed in the cavity,



1. Skull of Crossbill, side view; *a*, temporal muscle; *b*, great pyramidal muscle. 2. Head viewed from below; *b*, great pyramidal muscle; *c*, *c*, pterygoid muscles; *d*, *d*, graciles muscles. 3. Head viewed from the side; *a*, pterygoid process; *b*, os omoideum; *c*, os quadratum; *d*, *d*, os jugale. 4. Head viewed from behind; *a*, right temporal muscle; *b*, great pyramidal muscle. 5. Lower jaw, side view; *a*, cavity for articulation; *b*, *b*, coronoid processes. 6. Tongue seen from above; *a*, horny scoop; *b*, *b*, extensor muscles. 7. Tongue, side view; *a*, horny scoop; *b*, extensor muscles; *c*, flexor muscle. (Yarrell, *Zool. Journ.*, vol. iv.)

Head of Crossbill.

with the eye on that side to which the under mandible is curved.' So much for Buffon's 'error and defect of nature, and deformity.'

Description of Loxia curvirostra.—Adult and Old Male.—Principal colours of the plumage ash strongly tinged with greenish; front, cheeks, and eyebrows grey, with yellowish and whitish spots; back, small coverts of the wings, and scapulars, greenish; rump yellow; lower parts yellowish-green; abdomen grey, with deeper spots; wing and tail-feathers blackish, bordered with greenish; great and lesser coverts bordered with yellowish white; iris and feet brown; bill horn-colour. Length, about 6 inches.

Male from its first moult to the age of one year.—All the upper and lower parts of the body brick-red, more or less tinged with greenish and yellowish; wing and tail-feathers black, bordered with reddish-green; lower coverts of the tail white, with a great brown spot in the centre.

Young of the year.—Upper parts grey-brown, clouded with greenish; rump yellowish; lower parts whitish, with longitudinal brown and black spots.

Female.—In all ages, differing but little from the *young*; the plumage is clouded with greenish and yellowish tints. Neither in this species nor in *L. Pytiopsittacus* does the female ever assume the red livery, which is only peculiar to the male after its first moult up to the age of one year.

Such is M. Temminck's description in the second edition of his 'Manuel' (1820); but in the third part (1835), he states that the principal tints under which the *male* presents itself are more or less of a brick or vermillion-red, the middle of the belly being whitish. The *males of a year old* are of a tarnished red, of a yellowish-red, of a greenish-yellow, or tarnished yellow clouded with reddish. The *old females* have the upper part of the body deep grey, the rump of a yellowish green, the lower part of the body of a bright grey clouded with greenish. M. Temminck adds that he has seen *males* with the summit of the head, belly, and rump of a beautiful yellow, with a large brown band behind the eyes, and the rest of the plumage like the old female. M. Temminck says (in the same part) of the genus generally, that the red or reddish livery of the males is not, as had been erroneously believed, peculiar to a limited period of life, but is the perfect state of plumage in the male sex: after quoting M. Brehm's proofs of the nidification, M. Temminck goes on to state that the old males have a red plumage; the young a reddish plumage, reddish-yellow, or yellowish; the females a yellowish-green, and the young a grey or greyish plumage.

Mr. Gould (*Birds of Europe*) observes that in the minds of many naturalists some doubts still exist, and that they existed till lately in his own, as to whether the rich rosy-red colouring assumed by this bird is characteristic of the breeding season, or the permanent livery of the adult male He states that during his recent visit to Vienna he had an opportunity of observing both sexes in every stage, an examination of which afforded him abundant proofs that the red plumage is acquired during the first autumn, for he saw many lately fledged that had their plumage thickly spotted; others that had partially lost their spotted appearance, and had partly assumed the red colouring; and others that had their feathers entirely tinted of this colour; while the adults, as most ornithologists have stated, were characterised by a plumage of olive-green, which appears to be permanent.

This bird is *Loxia curvirostra* of Linnæus; *Becco in croce*, *Crocione* and *Crosiero* of the Italians; *Bec croisé* and *Bec croisé commun* of the French; *Fichten Kreuzschnabel* or *Kreutzschnabel* and *Mittlerer Gebirgs und Fichten-Kreutzschnabel* of the Germans; *Kruisvink* of the Netherlanders; *Mindre Korsnabb* of the Scandinavians; *Crossbill*, *Common Crossbill*, or *Shell-Apple* of the modern British; and *Gylfingroes* of the antient British.

Habits, Reproduction, &c.—Willughby, who notices its change of colour, says that it is a most voracious bird; much delighted and feeding very fat with hemp-seed. 'It also,' he adds, 'loves fir-kernels. ... They say, that with one stroke of its bill it will in a trice divide an apple in halves, that it may feed upon the kernels, by that means doing a great deal of mischief in orchards.' Mr. Townson, who kept some, states that the degree of the lateral power of these birds is surprising, that they are fond of exercising it for mere amusement, and are therefore not a little mischievous. 'My pets,' says the last-mentioned author, 'would often come to my table whilst I was writing, and carry off my pencils, little chip-boxes in which I occasionally kept insects, and other similar objects, and tear them to pieces in a minute. Their mode of operation is by first pecking a little hole; in this they insert their bill, and then split or tear the object by the lateral force. When I treated them, as I often did, with almonds in their shells, they got at the kernel in the same manner; first pecking a hole in the shell, and then enlarging it by wrenching off pieces by the lateral power.' Mr. Yarrell,—who, in his paper in the 'Zoological Journal,' from which we have taken the organization of the bill, observes that notwithstanding Buffon's assertion to the contrary,[*] they can pick up and eat the smallest seeds, and shell or husk hemp and similar seeds,—gives the following interesting account of the habits of a pair in captivity. We must premise that Willughby also remarked that when kept in cages they climb up and down the sides with their bills and feet, after the manner of parrots. 'My friend Mr. Morgan,' says Mr. Yarrell, 'kept a pair of these birds for some time, and had opportunities for observing their curious habits. They were impatient under confinement, and restless, climbing over the wires of their cage, by the use of their beak and claws, like parrots. One of their principal occupations was twisting out the ends of the wires of their prison, which they accomplished with equal ease and dexterity. A short flat-headed nail that confined some strong net-work was a favourite object on which they tried their strength; and the male, who was usually pioneer in every new exploit, succeeded by long continued efforts in drawing the nail out of the wood, though not without breaking off the point of his beak in the experiment. Their unceasing destruction of cages at length brought upon them sentence of banishment. During the period of their captivity a complete change took place in the colour of their plumage, without the shedding of a single feather.'

The *nest* is generally placed in the fork of a lofty branch in fir and other trees; it is built of moss, lichens, and other such materials, and lined with feathers. *Eggs* four or five, greyish or dirty white, with irregular bright blood-red patches at the larger end, and smaller specks dispersed over the remaining portions. Temminck says that in Livonia it builds in the month of May, but the general period of nidification mentioned by authors is during the winter or very early in spring. Whilst they are at work on the fir-cones their note is a gentle twitter, and they may be seen climbing about the branches like *Parrots*; but they are said besides to have a pleasant song, which is only poured forth in the winter months, or at the season of incubation.

M. Brehm declares that the nidification and laying of eggs takes place in all seasons, and he attributes this peculiarity to the comparative abundance or scarcity of food. It appears to be certain that *Crossbills* make their nests in December, as well as in March, April, and May.

Localities.—Germany, Poland, Sweden, &c., America (?)[†] and Japan, in which last locality it is called Isuga. The Prince of Musignano (C. Bonaparte) notes it as very rare and accidental, appearing only in the coldest winters near Rome; but as not rare in Philadelphia in the winter.[‡] It can only be considered as an occasional visitant to the British Islands. Willughby says, 'Sometimes they come over to us, and in the western part of England, especially Worcestershire, make bad work, spoiling a great deal of fruit in our orchards.' About the commencement of the present century a large flight came to the south of Ireland in the autumn, and did much damage to the apples, &c.; numbers of these birds were taken and kept in cages at that time. Mr. Selby notices the immense flocks that visited England and Scotland in 1821. They spread themselves through the country, and were to be seen in all woods and plantations where the fir-tree abounded. Their first appearance was in the early part of June, and the greater part of the flocks seemed to consist of females and the young of the year (the males possessing the red plumage assumed from the first moult to ıd of that year). Many of the females killed by Mr. showed plainly, from the denuded state of their s, that they had been engaged in incubation some previous to their arrival; which circumstance, he ob-, agrees with the account given of the early period at they breed in higher latitudes. They continued in n till towards the autumn, but kept moving north-for Mr. Selby found them in September particularly lant in all the fir-tracts of Scotland after they had disappeared south of the Tweed. Since that time rites in 1825) none had come under his observation. lludes to the great havoc they commit in the apple ear orchards in their occasional visits to the south, itting the fruit in halves for the sake of the enclosed Mr. Hoy, of Stoke Nayland, in Suffolk, who gives teresting account of the habits of these birds, says from 1821 to the middle of May, 1822, Crossbills were umerous in that county, and, he believes, extended flights into many parts of England. (Loudon's *Mae of Nat. Hist.*, January, 1834.) Mr. Knapp notices asional visits in small parties, and the damage it does orchard. He says that a pair was brought to him arly in August, and the breast of the female being bare of feathers, as is observed in sitting birds, he it is probable that she had a nest in the neighbour-There are a few instances recorded of its breeding

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[*] Buffon's words are, 'Les deux pointes ne pouvant se rencontrer, l'oiseau ne peut ni becqueter, ni prendre de petits grains, ni saisir sa nourriture autrement que de côté.'

[†] But note: Mr. Gould, at a meeting of the Zoological Society of London, showed that the Crossbill of North America is very distinct from that of Europe, the Loxia curvirostra, Linn. It is one-third less in all its proportions, and is somewhat less brilliant in colouring. ('Zool. Proc.,' 1834.)

[‡] Such is the prince's statement in the 'Specchio Comparativo;' but in his recent and valuable 'Geographical and Comparative List of the Birds of Europe and North America' (London, 1838), he corrects this, and, confining *Loxia curvirostra* to Europe generally, gives *Loxia Americana* as the American form.

ity to Man.—The flesh of the Common Crossbill is flavoured. Mr. Gould saw in the bird-market of a multitudes of Crossbills exposed for sale with swal-nartins, and many others of the smaller birds, for the es of the table; of these the Crossbill appeared to cially in request from its superiority of size and its and well-tasted flesh, to the good qualities of which ould bears testimony. The same author notices it ming to be of all the small birds the least distrustful n, and states that when flocks arrive in this country rs are taken by a bird-limed twig attached to the a fishing-rod.

curvirostra, male: upper figure, young of the year; lower, adult.

XODROMIC SPIRAL (λοξός, oblique, δρόμος, course), rve on which a ship sails when her course is always point of the compass. It is called in English works UMB LINE.

YOLA. [JESUITS.]

ZE'RE, a department in the south of France, bounded north-east by the department of Haute-Loire, on the y that of Ardèche, on the south-east and south by of Gard, on the south-west and west by that of on, and on the north-west by that of Cantal. The of the department is nearly oval; its greatest length m north-west to south-east, from the banks of the river Bès, which separates this department from that ntal, to the neighbourhood of St. Jéan de Gard [GARD], 64 miles; its greatest breadth is, from the banks of the Borne, which separates this department from that of Ardèche, to the junction of the Jonte and the Tarn, 57 miles. The area of the department may be estimated at 1992 square miles, being considerably under the average size of the French departments, and rather less than the English county of Norfolk. The population in 1831 was 140,347; in 1836 it was 141,733, showing an increase in five years of 1386, or less than one per cent., and giving 71 inhabitants to a square mile, less than one-half the average density of population in France, and about equal to the density of population in Westmoreland, the most thinly peopled of the English counties. Mende, the capital, is in 44° 31′ N. lat. and 3° 29′ E. long., 302 miles in a direct line south by east of Paris, or 335 miles by the road through Montargis, Nevers, Moulins, Clermont, and St. Flour.

The department is altogether of a mountainous character. The Cévennes cross it in the south-western part; Mont Lozère, one of the loftiest mountains of this range, is 4885 feet high (Malte Brun), and gives name to the department: the Roc de Malpertus in the immediate neighbourhood of Lozère (if indeed it be not one of the peaks of Lozère itself) is 5508 feet high. The chain of La Margeride, which branches off from the Cévennes at Mont Lozère, and unites that mountain-range with the volcanic group of Auvergne, extends through the department in the direction of its length; and the mountains of Aubrac overspread the eastern part, and extend into the adjacent department of Aveyron. The mountain-ranges of the Cévennes and La Margeride determine the watershed of the department, and divide it between three of the great river-basins of France. The small portion on the south-east, separated from the rest by the crests of the Cévennes, belongs to the basin of the Rhône; the rest of the department is divided by the mountains of La Margeride, between the basin of the Loire in the north and that of the Garonne in the west: the part comprehended in the basin of the Garonne is considerably larger than either of the others.

The department is chiefly occupied by the primitive rocks which constitute the mass of the Cévennes and the connected mountains. On the south-eastern slope of the Cévennes, towards the basin of the Rhône, the granites and other primitive rocks are covered with the strata of later formation which intervene between the chalk and the saliferous sandstone. The same strata overspread a considerable portion of the western side of the department on the banks of the Tarn and the Lot, and in the country between them. One or two extinct volcanoes have been observed within the limits of this department; but they are not so numerous as in the adjacent departments of Haute-Loire and Cantal.

The mineral wealth of the department is not great: lead, silver, antimony, copper, and iron ore are procured. There is not however any coal, nor are there any works for smelting or working iron. Marble, freestone for building, and gypsum, are quarried; and there are some mineral springs, of which the most frequented are those of Bagnols les Bains near Mende.

The rivers are all small in that part of their course which lies within the department. To the basin of the Rhône belong the Cèze, which rises in Mont Lozère, and brings down particles of gold; the Gardon d'Alais, the Gardon de Mialet, and the Gazizan, which unite their streams in the adjacent department of the Gard, on the eastern border of which all these rivers join the Rhône. The Chassezac and the Borne water the east side of the department, and flow by the Ardèche into the Rhône. To the basin of the Loire belong the Allier, which rises in the north-eastern slopes of La Margeride, and for some distance separates this department from the adjacent departments of Ardèche and Haute-Loire; the Chapeauroux and the Ance, which also rise on the same slope and flow northward into the Allier. To the basin of the Garonne belong the Lot and the Tarn. The Lot rises in the south-western slope of La Margeride, not far from Mont Lozère, and flows west by Mende and Chanac into the department of Aveyron: nearly 40 miles of its course belong to this department. It receives the Coulanges and some other small streams: the Coulagnet and some others fall into the Coulanges. The Trueyre, or Truyère, a more important tributary, rises in the slope of La Margeride, and flows north-west; it does not join the Lot till far beyond the boundary of this department. The Bès, a tributary of the Truyère, forms the boundary between carried on to some extent. Chesnuts are prepared for sea-stores in considerable quantity. But the different branches of industry are not sufficient to give employment to the inhabitants, a number of whom emigrate yearly to the more southern departments to obtain work as mowers and reapers. The trade of the department is trifling; the want of navigable rivers and the labour of the conveyance over the mountains are great impediments. The exports are cattle, chesnuts, and woollen stuffs.

The department constitutes the diocese of Mende, the bishops of which are suffragans of the archbishop of Alby. It is in the jurisdiction of the Cour Royale and the circuit of the Académie Universitaire of Nîmes. It is in the ninth military division, the head-quarters of which are at Montpellier. It returns three members to the Chamber of Deputies. In respect of education it is below the average of France; the number of young men enrolled in the military census of 1828-29 who could read and write was twenty-seven in every hundred, the average of France being thirty-nine.

This department formerly constituted the territory of the Gabali, a Celtic people. Their capital was Anderitum, afterwards called Gabali, from the name of the people, now Javols, a village between St. Chely and Mende. Several antiquities have been discovered at Javols; such as the ruins of columns, statues, and buildings; coins, medals, and vases. Traces of the Roman road from Lugdunum (Lyon) to Tolosa (Toulouse) have been observed in this department. Some of the Celtic monuments called dol-mens are yet in existence.

Before the Revolution this department constituted for the most part the province of Gévaudan in Languedoc. Portions of the district of Le Velay and of the diocese of Uzès, both also in Languedoc, are included in the present limits.

LÜBECK is situated in 53° 51′ N. lat. and 10° 50′ E. long., on a long eminence between the rivers Trave and Wakenitz. Its territory is bounded on the east by Mecklenburg Strelitz, on the west by Oldenburg and Holstein, and on the south by Lauenburg; the northern part, between Holstein and Mecklenburg, extends to the Baltic. Its territorial possessions were formerly very scattered; some detached portions were in Holstein, some in Lauenburg, and others in Mecklenburg. By the decision of the diet in February, 1803, modified in 1804 by a treaty with Oldenburg, it obtained, in exchange for many of its distant districts, a continuous tract on the Trave. It is very uncertain at what time a town was first erected on this spot. There is evidence that a flourishing commercial town existed here in the eighth century, which was built by the Wilzen, a Slavonian tribe, as a place of arms, on the banks of the Schwartau. This was Old Lübeck, which was however soon taken by the Obotriti, whose king, Henry, chose it for his residence. In 1139 the Rugians took the place and totally destroyed it, upon which Adolphus II., count of Holstein, founded the present city of Lübeck on the banks of the Trave in 1140. He peopled it with fugitives and settlers from Westphalia and the Netherlands, and merchants from Bardewick; but Henry the Lion, duke of Saxony, being jealous of the rapid rise of Lübeck, to the detriment of Bardewick, did his utmost to interrupt its commerce by land. In 1157 the city was nearly destroyed by fire. In 1158 Adolphus ceded it and its territory to Henry the Lion, who rebuilt the town, surrounded it with walls, gave it magistrates of its own, granted it several privileges, allowed the northern nations a free trade to it, and gave it the celebrated code of laws called *das Lübische Recht*, which was subsequently adopted by so many countries and cities. In 1163 the see of the bishopric of Oldenburg, founded in 952 by the Emperor Otho I., was transferred, at the instance of Bishop Gerold, to Lübeck. This proved a great advantage to the city. The churches of St. Mary and St. Peter were already built, and the cathedral was founded by Bishop Gerold in 1170. Henry the Lion being put under the ban of the empire, Lübeck was forced to submit to the emperor Frederick I., during whose absence in the Holy Land, Henry returned from England, and recovered it, but had held it only three years when it was taken by Adolphus III., count of Holstein (1192). Ten years later it was taken by Woldemar, brother of Canute, king of Denmark. The Danes proved very oppressive masters, and the citizens, taking advantage of some favourable circumstances, expelled the Danish garrison in 1226, and placed themselves under the protection of the emperor Frederick II., who confirmed all their privileges, and made Lübeck a free imperial city.

The citizens had many contests to maintain with their jealous and powerful neighbours, but their valour and prudence triumphed on every occasion. The wealth and power of Lübeck increased, and it joined the Hanseatic League, of which it became the head. [Hanse Towns.] Its fleets commanded the Baltic; Gustavus Wasa found an asylum in its walls against Christian II., and Lübeck's voice decided in the affairs of the kingdoms of the North. As an evidence of the prosperity of Lübeck during the flourishing period of the Hanseatic League, it may be stated that the dreadful pestilence called the 'black death' is said to have carried off in five months, in 1350, between 80,000 and 90,000 persons, without depriving the city of more than half of its population. This number is presumed however by some writers to be far above the truth; yet it appears that, 200 years later, in April, 1580, between 50,000 and 60,000 citizens able to bear arms were numbered, which would certainly imply a population of 200,000 souls. From the dissolution of the Hansa in 1630 to the present day, Lübeck has passed through numerous vicissitudes. The storms of the French revolution fatally affected Lübeck. The occupation of the city by Blücher after his retreat from the battle of Jena, and his brave but unsuccessful defence against 70,000 French soldiers, led to the plunder of the town during three days, when many of the defenceless citizens were murdered, and property to an immense amount was carried off or wantonly destroyed. Lübeck, like Hamburg, was incorporated with the French empire in 1810, and so remained till it recovered its freedom after the battle of Leipzig in 1813.

Lübeck, in its present state, is no longer a fortified town; the old ramparts are converted into public walks, and the city, being on a moderate eminence between the Trave and the Wakenitz, is very pleasantly situated, and is very clean and cheerful. The interior is more regular than in most of the old German towns, it being intersected by several broad and straight streets. The houses are built of stone. A great number of the houses are in the old-fashioned style, with the gable ends towards the street, but the more modern are in better taste. Besides the cathedral, which contains valuable paintings and remains of antiquity, there are five parish churches, of which that of St. Mary is celebrated as one of the finest Gothic churches in northern Germany. It is 340 feet long, and the middle nave 152 feet high (so stated by Zeitz) and 45 wide. The church contains valuable paintings by Holbein, Vandyck, Perugino, Aldderfor, and other masters, a very curious astronomical clock, a 'Dance of Death,' a fine organ, and a remarkable altar by Guillinus of Antwerp, &c. The other churches are much inferior to St. Mary's. Lübeck is celebrated for its charitable institutions, which are numerous and admirably conducted. The other public establishments and buildings are the gymnasium, the commercial institution, the patriotic society, the mechanics' school of design, the Roman Catholic chapel, the Calvinist church, and many others. The senate-house, an antient Gothic building, contains the hall where the deputies of the Hansa formerly met.

The territory which we have already described, including the detached district and those which it possesses in common with Hamburg [Hamburg], is about 130 square miles in extent, with a population which may now be estimated at 46,500, that of the city being 26,000 at the most, that of Travemunde 1100, and of Bergedorff and its district 5300. The manufactures are of very various kinds, but none on a large scale.

The commerce of the city is beginning to be of considerable importance. It has 80 ships of its own, and the arrivals are above 900 annually. At the moment that this article is written, a question of vital importance is pending. Between Hamburg and Lübeck there has always been a great transit trade; the route is partly through the Danish territories, and has hitherto been free from all tolls. But in defiance of antient and still subsisting treaties between Denmark and the two cities, the Danish government has lately imposed a very heavy duty on all goods going from Hamburg to Lübeck, and *vice versâ*. It is singular that the duty on the first is fixed at double that on the second. It almost seems as if this were in a spirit of hostility to England, as the goods, chiefly British colonial produce and manufactured articles, sent from Hamburg to Lübeck, amount to above a million sterling annually, while the Russian and Swedish goods from Lübeck to Hamburg do not exceed 200,000*l*. The two cities have appealed to the diet of the German confederation, whose decision is anxiously expected. For some years past there has been a regular communication by steam-boats between Lübeck and St. Petersburg: the voyage is generally made in three and a half or four days. (Hassel, *Geog.*, vol. v.; Stein, *Geog.*; Zeitz, *Ansichten von Lübeck*.)

LÜBECK (Principality). [OLDENBURG.]

LUBIENIETSKI (Latinized *Lubieniecius*). There are five persons of this name (one Andrew, two Christopher, and two Stanislaus), all distinguished in the Polish Socinian controversy. A list of their several writings may be found in Sandius, 'Bibl. Antitrin.,' Freistadt, 1684. The subject of the present article is Stanislaus the younger, son of Christopher, who was born at Cracow, August 23, 1623, and died in exile at Hamburg, May 18, 1675. He was minister of a church at Lublin, until driven out by the arm of power for his opinions. He died, as is stated, by poison; a fact borne out by the death of his two daughters, and the serious illness of his wife, after eating of the same dish, and by the neglect of the Hamburg magistracy to institute the investigation usual in cases of sudden death.

The theological works of Lubienietski are numerous, and may be found in Sandius, with the exception of the 'Historia Reformationis Polonicæ,' published in 1685, at Freistadt, with a Life prefixed. But the work which makes his reputation more European, and entitles him to a place here, is his 'Theatrum Cometicum.' This work was published at Amsterdam in 1667 (Sandius and Weidler), but a copy in our possession has a Leyden title-page, and the date 1681. This change of titles in different parts of the same edition was formerly not uncommon, and has caused much confusion. A pictorial frontispiece has the following anagram for Stanislaus Lubieniecius: 'Satis in ulna Jesu lucebis.'

The 'Theatrum Cometicum' consists of three parts. The first contains the correspondence of the author with men of science throughout Europe on the subject of the comets of 1664 and 1665; and has in it communications from Vossius, Oldenburg, Hevelius, Kircher, Bouillaud, Von Guericke, &c. &c. The second part contains an elaborate account of all the comets (415 in number) recorded in history down to the year 1665. It is written in support of the hypothesis that comets portend both good and evil, in opposition to the prevailing notion that they were harbingers of misfortune only; and this opinion is supported by history, it being clearly shown that public events of both characters usually followed close upon comets. Thus he points out that though the comet of 323 strengthened the heresy of Arius, it also brought about the council of Nice; and this, from Lubienietski, was not a little satirical. We are in doubt whether to conclude that the author maintained his hypothesis in good faith, or to suspect that he chose his line of argument as the best practical mode of attacking the prevailing terrors. And our doubt becomes stronger when we see that in the third part, called 'Theatri Cometici exitus,' he rather widens his hypothesis; and whereas he had before maintained that comets foretell both good and evil, he now asserts the dilemma that they predict *both or neither*, but still cautiously.

In the late discussions about Halley's comet this work of Lubienietski was freely cited in proof of one and another former appearance, or presumed appearance, of that memorable body. It seems to have been taken for granted that the mere mention of a comet by this author is sufficient evidence of its having really appeared. It may be useful therefore on future occasions to recommend those who would prove a comet from the 'Theatrum Cometicum' (and the same caution may be given with respect to Riccioli's list), first to examine the authority on which the fact rests. Lubienietski has collected every instance, and gives his originals; but this, though done with care and great learning (exhibiting a mass of research which will appear wonderful when we remember that the investigator was driven from country to country, and engaged in continual theological controversy), should only serve to enable the reader to discriminate. Many of the authorities cited are worthless, and it even happens that the original historian of one of Lubienietski's comets was born many hundred years after the phenomenon for the appearance of which he is made sufficient evidence.

LUBLIN, a woiwodschaft, or province, of the kingdom of Poland, is composed of the circles of Lublin, Chelm, Josefow, and Zamoski, which formerly belonged to the kingdom of Galicia, and were ceded by Austria in 1810 to the grand-duchy of Warsaw. It lies between 50° 17′ and 51° 43′ N. lat., and 21° 45′ and 24° 7′ E long., comprising an area of 6650 square miles, with a population of 500,000 inhabitants. It is bounded on the north by Podlachia, on the east by Russia, on the south by Galicia, and on the west by Sandomir. The Vistula separates it from Sandomir, the Bug from Russia, and the Wieprz (which flows through it) for some distance from Podlachia. This province has extensive forests, and in some parts morasses, but likewise contains tracts of good arable land, and pasturage with a fine breed of cattle. There are no metals except bog-ore. It is divided into four circles (in Polish *obwod*), viz. Lublin, Zamosz, Hrubieszow, and Krasnistaw.

The principal towns in the circle of Lublin, besides the capital, are the following: Lubartow, on the Wieprz, has a fine castle, three churches, a Capuchin convent, and 3190 inhabitants. Kurow, on the Kurowka, has a fine palace of Count Potocki, two churches, and 1920 inhabitants. In 1816 a mineral spring was discovered, the waters of which resemble those of Pyrmont: Pulawy, on the Vistula, was once the residence of Prince Czartoryski, whose splendid palace, with its library of 60,000 volumes, many MSS., a collection of rare Polish antiquities, and countless treasures of art, was celebrated throughout Europe. The park was the finest in Poland, with the famous temple of the Sibyl, the country-seats of Marynke and Parchatka, and the Dutch dairy-farm in an island of the Vistula, the banks of which were covered with pretty country-houses. Such was Pulawy, but all is now desolate; the Russians laid the whole waste in 1831, during the ill-fated Polish revolution, when the treasures of art were destroyed, despoiled, or carried away, the estate confiscated, and the noble owner driven into exile. Zamosz, the capital of the circle of that name, a very strong fortress, is situated on the Wieprz. It was founded in 1588 by John Zamoyski, after his victory over the archduke Maximilian of Austria. The houses were built in the Italian style; and a high school with a considerable library, which was long celebrated, was founded in 1605. The Cossacks and Swedes besieged it without success. On the partition of Poland, it fell to the share of Austria. In 1809 the Poles took it; and in 1813 the Russians. In 1820 the Polish state bought the town and environs of Count Stanislaus Zamoyski, who received for it above fifty estates belonging to the state. Hereupon the place was still more strongly fortified, and was deprived of its extensive suburbs. It has however still above 4000 inhabitants, with the fine extensive palace of Count Zamoyski, several considerable buildings, among which are the arsenal, four churches, the town-hall, two convents, and a theatre. All the learned institutions are abolished. Hrubieszow, situated on the Hulzwa, in the midst of marshes, has three churches, a convent, and 3900 inhabitants. Krasnistaw, on the Wieprz and a lake, is a walled town; it has a palace, formerly the see of the Romish bishop of Chelm, who now resides at Lublin, several churches, and 2952 inhabitants, among whom are many Jews. Chelm, in this circle, the see of a Greek bishop, has a castle on a high hill, several Greek and Romish churches, a Piarist college, a gymnasium, and 2000 inhabitants.

LUBLIN, the capital of the government and of the circle, is in 51° 16′ N. lat. and 22° 30′ E. long. It is situated on an eminence on the river Bystricza, and is surrounded with walls, ditches, and great lakes; it is divided into the upper and lower town, of which the latter is chiefly inhabited by Jews. It has a dilapidated castle on a hill, and is the seat of a bishop and court of appeal. The most considerable buildings are the fine town-hall, eighteen churches, of which the cathedral, dedicated to St. Michael, and the churches of the Ex-Jesuits, the Visitandines, the Dominicans, and the Carmelites, are worthy of notice; there are twelve monks' and six nuns' convents (some of which have been suppressed), a Piarist college, a synagogue, a gymnasium, an academy of sciences, an agricultural society, and several hospitals and charitable institutions. The town has three annual fairs, which were frequented by great numbers of German, Greek, Russian, Armenian, and Turkish merchants, and it had a great trade in woollen cloths, corn, and Hungarian wines; but the late events have doubtless had an injurious effect on the trade of the town, as they have had on the manufacture of woollen cloths, which was just beginning to flourish. The population is 12,500.

LUC, DE. [De Luc.]

LUCA'NUS, MARCUS ANNÆUS, was born at Corduba (Cordova), in the province of Bætica, in Spain, A.D. 38. He was the son of M. Annæus Mela, who was the brother of the philosopher Seneca, and was carefully educated at Rome under the most eminent philosophers and rhetoricians of the time. His poetry recommended him to the notice of Nero, who treated him with distinguished honour, and bestowed upon him the dignity of quæstor and augur. Lucan did not however remain long in the imperial favour. Nero was ambitious of being considered the best poet of his age; and Lucan was foolish enough to enter into competition with his imperial master, and to receive the prize for the best poem in a literary contest with the emperor. Lucan was accordingly forbidden to publish any more poems; and simply, as it appears, on account of this prohibition he entered into a conspiracy with Piso and many others to assassinate Nero. (Tac., *Ann.*, xv. 49.) This conspiracy was detected, and Lucan, being condemned to death, opened his veins, and died repeating some of his own verses, which described the death of a wounded soldier in consequence of loss of blood. (Tac., *Ann.*, xv. 70.) He died A.D. 65, in the twenty-seventh year of his age.

Lucan wrote many poems, which have not come down to us; which were entitled respectively, 'Catacausmos Iliacus,' 'Catalogus Heroidum,' 'Hectoris Lyra,' 'Orpheus,' 'Saturnalia,' 'Silvarum libri x.,' 'Medea,' an unfinished tragedy, 'Satiricæ Fabulæ xiv.,' &c. The only work extant is a poem on the civil war between Cæsar and Pompey, entitled 'Pharsalia,' which gives an account of the war from its commencement to Cæsar's visit to Cleopatra in Egypt. The poem is comprised in ten books at present; but since the tenth book leaves off abruptly in the midst of a narrative, it is probable that some part has been lost, or that the poet had not finished the work at the time of his death. The first book opens with the most extravagant adulation of Nero, in which the poet even exceeds the base subserviency of the poets of the age of Augustus. The 'Pharsalia' contains many vigorous and animated descriptions, and the speeches are characterised by considerable rhetorical merits, but the language is often inflated, and the expressions extremely laboured and artificial; the poem is also deficient in that truth to nature, and in those appeals to the feelings and the imagination, which excite the sympathy of every class of readers. Still great allowance must be made for the youth of the author, who, if he had lived longer, would probably have cured himself of those faults and defects which are now so conspicuous in his poem.

The best editions of Lucan are by Burmann (1740), Bentley (1760), Weber (1831), and Weise (1835). Among the numerous translations of the 'Pharsalia' those most deserving of notice are—in French, by Marmontel (1766), and Brébeuf (1795); in English, by Rowe (1718), and by May (1627), who also published in 1630 a continuation of the poem to the death of Julius Cæsar, which he afterwards translated into Latin verse (1640); and in Italian, by Cristoforo Bocella (1804).

LUCAS, PAUL, born at Rouen in 1664, first travelled in the Levant as a jeweller, after which he entered the Venetian service against the Turks. In 1696 he returned to France, bringing with him a collection of antient coins, engraved stones, and other curiosities which were purchased for the king's cabinet of medals. In 1699 he went to Egypt, and ascended the Nile as far as the cataracts. He afterwards visited Cyprus, Syria, Armenia, and Persia, but was at last plundered at Bagdad of most of the objects of curiosity which he had collected in his journey. He returned to Paris in 1703, and published the narrative of his journey, 'Voyage au Levant,' 1704, which contains numerous exaggerations and absurd stories. Lucas was not deficient in observation, but he did not always tell the truth; perhaps he thought that a dash of the marvellous would enhance his narrative, or perhaps he listened credulously to the stories of others. In 1705 he was sent by Louis XIV. to the Levant again, for the purpose of making collections, and he visited Asia Minor, Macedonia, Syria, and Barbary, and returned to France in 1708. He published the narrative of this second journey in 1710: 'Voyage dans la Grèce, l'Asie Mineure, la Macedoine, et l'Afrique.' This work contains some interesting memoirs by other travellers concerning Cyrenaica and Tunis. Louis XIV. sent him out again in 1714, when he visited most of the same countries which he had seen in the preceding journey, for the purpose of correcting his former observations. He returned to Paris in 1717, and in 1719 published an account of this third journey: 'Voyage dans la Turquie, l'Asie, Syrie, Palestine, Egypte, &c.,' which is the best of the three, though it also contains some strange stories. Lucas travelled once more in the Levant, and at last died in Spain, in 1737, having gone thither for the purpose of examining the antiquities of that country.

LUCCA, DUCHY OF, a small state in Italy, south of the Apennines of Modena and between them and the sea, is bounded on the north by the territories of Modena, on the east and south by the grand-duchy of Tuscany, and on the west by the sea. It is watered by the river Serchio, which rises in the Apennines of Garfagnana and enters the Mediterranean a few miles north of the Arno. Its area is about 320 Italian square miles of 60 to one degree of latitude. (Serristori, *Saggio Statistico.*) Its population is 152,000, being the most densely inhabited state of Italy.

The territory of Lucca is naturally divided into three regions: 1st, the mountainous districts among the Apennines, including the valley of the Lima, an affluent of the Serchio; 2nd, the valley of the Serchio, including the fine plain of Lucca, which is cultivated like a garden; 3rd, the flats near the sea, which are in part marshy, but produce good pasture for cattle. The people are very industrious and shrewd; many of them emigrate to foreign countries, where they work as plasterers and image-makers, and others from the mountainous districts repair every winter to the maremme of Tuscany and other neighbouring states to work in the fields, whence they return home in the summer.

The country is divided for administrative purposes into eleven 'Comuni,' namely, Lucca, Viareggio, Capannori, Villa Basilica, Camaiore, Montignoso, Borgo, Coreglia, Bagni, Gallicano, Minucciano. At the head of each commune is a political officer called Gonfalonière, and likewise a judge called Commissario Giusdicente. In the town of Lucca are the civil, criminal, and commercial tribunals for the whole duchy. There is also a Lyceum with 28 professors, attended by about 180 students, and with a library of 16,000 volumes, two clerical seminaries, and a college for 60 boarders, besides 16 grammar-schools, in the whole duchy, attended by 427 pupils, and 102 elementary schools, 39 of which are gratuitous, attended altogether by 2310 pupils. For female education there are the Institution of Maria Luisa, the Conservatorio, and an Ospizio for the poorer class, the whole of which board about 524 girls. The clerical establishment consists of one archbishop (of Lucca), 4 chapters, 230 parish-incumbents, 625 priests, and 429 clerici having the minor orders only. There are also 12 convents of men with 391 inmates, and 11 convents for females having altogether 453 nuns. The military consists of one battalion of infantry, one company of artillery, and a body of gendarmes, in all 750 men, besides 2000 militia. The public revenue is 1,900,000 Italian livres, or francs. The chief heads of the expenditure are, 396,000 livres for the duke's civil list; 281,000 for the military; 1,223,000 for the expense of the administration. The communes tax themselves for their local expenditure, which amounts to about 150,000 livres altogether.

There are nearly 40,000 landed proprietors in the whole duchy, or about one to every four individuals; 6300 persons employed in trade and manufactures; 1270 employed in the civil departments under government, and 450 seamen. Viareggio, with 6000 inhabitants, is, next to Lucca, the principal town of the duchy; it has a roadstead which it frequented by coasting vessels, both native and foreign, which take in cargoes of oil, timber, beans, and other minor articles. The value of the oil exported is about 600,000 livres, and that of sik is 200,000. The principal article of importation is salt fish. The manufactures of the country consist of silks, which employ 2500 workmen; woollens, which give employment to 900 persons; paper, glass, iron and copper works, linen and cotton cloths, and hats.

The present duke of Lucca is Carlo Ludovico, son of Ludovico, prince of Parma, and of Maria Luisa of Spain. Carlo Ludovico was born in 1799, and he succeeded to the sovereignty after the decease of his mother in 1824. He then reduced his own civil list by one third, namely, 198,0 Italian livres, and has since made other useful reforms improvements in his little state.

LUCCA, the capital of the duchy, is situated in a rich plain watered by the Serchio, and surrounded by mountains: it is twelve miles from the sea, and about ten miles north-east of Pisa; its circumference is a little more than three miles, and it contains 22,000 inhabitants. Lucca is surrounded by ramparts, which are planted with trees, and form a very pleasant promenade. The town is well-built, and is supplied with good water, and the streets are well paved and clean.

Lucca, like most other Italian cities, is rich in churches: the cathedral, which belongs to the eleventh century, is adorned with several good paintings, and still more with statues and monuments by the native sculptor Civitali. The archiepiscopal archives and those of the chapter contain a vast mass of historical documents, parchments, and MSS., some as old as the seventh century, the oldest probably in Italy. The other remarkable churches of Lucca are, St. Frediano, which has some fine Roman columns; St. Francesco, with the tomb, indicated by a simple inscription on the wall, of the greatest man that Lucca has produced, Castruccio Castracani; St. Cristoforo, with the tomb of the sculptor Civitali; St. Michele; St. Paolino; St. Giovanni, with its baptistery; St. Maria in Corte Landini, which contains several good paintings; the annexed convent belongs to the 'Chierici Regolari della Madre di Dio,' an order founded at the end of the sixteenth century by Giovanni Leonardi, a native of Lucca, which has produced many learned men. It has a library of 20,000 volumes. The ducal palace is vast, but unfinished; it has a gallery of valuable paintings by the great masters, and a library of 25,000 volumes. The palazzo Pretorio, or town-house, which belongs to the fifteenth century, is a massive sombre building. The palace Guidiccioni, where the public archives are kept, and that of the Marquis Bernardini, are also worthy of notice.

The academy of letters and sciences of Lucca, instituted in 1817, which consists of thirty-six members, holds its meetings once a month in a hall of the Lyceum, and has published several volumes of 'Atti,' or memoirs. The duke is perpetual president.

Lucca ('Luca') is mentioned in antient history as a town belonging to the Etruscans after they had conquered the country between the Arno and the Macra and taken it from the Ligurians. It afterwards became a Roman colony. There are still remains of a Roman theatre, and of an amphitheatre.

Lucca in the middle ages was a republic, often at war with Pisa and Florence. It was at one time with Pisa at the head of the Guibeline party [CASTRUCCIO CASTRACANI]; it afterwards fell under the yoke of the Visconti of Milan, was restored to its liberty by the emperor Charles IV. in 1370, was subject successively to several tyrants, and at last settled gradually into a narrow aristocracy. One of its citizens, Burlamacchi, about 1546, being made gonfalonière, attempted a revolution for the purpose of restoring the popular government, not only at Lucca, but in all the other Tuscan cities. Being discovered, he was arrested and given up to the imperial governor of Milan, who put him to death. [BURLAMACCHI, FRANCESCO.] In 1556 a law was passed at Lucca, on the proposal of the gonfalonière Martino Bernardini, by which only a certain number of families were eligible to office: this law, which was called 'Martinian,' established a close aristocracy like that of Venice. In 1600 the privileged families were 160; in 1797 they were reduced to 88, the others having become extinct. From among these families was elected a 'Signoria,' or executive of nine 'Anziani,' or elders, and a gonfalonière, a senate of 36 members, and a great council of 90. In this manner Lucca was administered for more than two centuries in peaceable obscurity. In 1799 the French, under General Serrurier, entered Lucca, placed a garrison in it, emptied the arsenal, carried away all the brass cannon from the ramparts, and exacted two millions of francs, besides supplies of provisions, professing all the time to have the greatest regard for the antient republic of Lucca. Meantime the democratic party, supported by the French, demanded a change in the form of government; the Martinian law was abolished, and a constitution after the then prevalent fashion, with two councils and a directory, was proclaimed. In 1805 Napoleon, having re-established monarchy both in France and Italy, gave Lucca to his sister Eliza as a principality, with new constitutional laws.

In 1814 the Congress of Vienna gave Lucca to Maria Luisa of Spain and her son, the widow and child of the Prince of Parma; the latter duchy being given to Maria Louisa of Austria, Napoleon's consort, for her life. It was also stipulated that after the death of Maria Louisa, the present duchess of Parma, the duke of Lucca should have again his ancestral duchy of Parma and Piacenza, and Lucca should be united to the grand-duchy of Tuscany, with which, geographically speaking, it is naturally connected. (Valéry, *Voyages en Italie*; Botta, *Storia d'Italia*; *Memorie e Documenti per servire all' Istoria del Ducato di Lucca*, 4 vols. 8vo., Lucca, 1818; Lucchesini, *Storia Letteraria di Lucca*.)

LUCERN. [LUZERN.]

LUCERN (*Medicágo sativa*), a plant of the Linnæan class Diadelphia and order Decandria, with a papilionaceous flower, and of the natural family of the Leguminosæ. There are many species of the Medicago, of which one is supereminent as an artificial grass in temperate climates, and a most valuable plant for feeding cattle. It was in high repute among the antients. The authors *De Re Rustica* speak of it with enthusiasm, and all over the continent of Europe, wherever husbandry has made any progress, it is in high reputation. Lucern is a plant which will not bear extreme frost nor superabundant moisture, and its cultivation is therefore restricted to mild climates and dry soils; but, where it thrives, its growth is so rapid and luxuriant, that no other known plant can be compared to it. In good deep loams lucern is the most profitable of all green crops; when properly managed, the quantity of cattle which can be kept in good condition on an acre of lucern, during the whole season, exceeds belief. It is no sooner mown than it pushes out fresh shoots, and wonderful as the growth of clover sometimes is in a field which has been lately mown, that of lucern is far more rapid. Where a few tufts of lucern happen to be, they will rise a foot above the surface, while the grass and clover, which were mown at the same time, are only a very few inches high.

Lucern, sown in a soil suited to it, will last for many years, shooting its roots downwards for nourishment till they are altogether out of the reach of drought. In the dryest and most sultry weather, when every blade of grass droops for want of moisture, lucern holds up its stem, fresh and green as in a genial spring. The only enemies of this plant are a wet subsoil and a foul surface. The first is often incurable; the latter can be avoided by good cultivation.

It is useless to sow lucern on very poor sands or gravel, or on wet clays. The best and deepest loam must be chosen, rather light than heavy, but with a good portion of vegetable earth or humus equally dispersed through it. If the ground has been trenched, so much the better; and if the surface is covered with some inferior earth from the subsoil, it will be no detriment to the crop, for it will prevent grass and weeds from springing up, and save much weeding. The lucern will soon strike down below it. It is not a bad practice to cover the lucern-field with a coat of coal-ashes or poor sand, merely to keep down the weeds, where this can easily be done.

The soil in which it is intended to sow lucern-seed should be well prepared. It should be highly manured for the two or three preceding crops, and deeply ploughed if not trenched. It should be perfectly clean, and for this purpose two successive crops of turnips are most effectual. The turnips should be fed off with sheep. In the month of March, the land having been ploughed flat and well harrowed, a very small quantity of barley, not above a bushel to the acre, may be sown, or rather drilled on the ground, and at the same time from 30 to 40 lbs. of lucern-seed sown broad-cast, and both harrowed in and lightly rolled. If the land will not bear to be laid flat without water-furrows, it will be useless to sow lucern in it.

As the crop comes up it must be carefully weeded: no expense must be spared to do this effectually, for success depends upon it. When the barley is reaped, the stubble, which will probably be strong, should be pulled up by the hand-hoe, or by harrowing, if the plants of lucern be strong, and, at all events, the ground must be cleared of weeds. It must not be fed off with sheep; they would bite too near the crown. Lucern should always be cut as soon as the flower is formed. If it is kept clear of weeds the first year, there will be little difficulty with it afterwards, when the roots have become strong. The second year the lucern will be fit to cut very early, and in a favourable season it may be cut four or five times. After each cutting it is useful to draw heavy harrows over the land, or an instrument made on purpose resembling harrows, the teeth of which are flat, and cutting the soil like small coulters. It will not injure the plants, even if it divide the crown of the root, but it will destroy grass and weeds. Liquid manure which consists of the urine of cattle and drainings of dunghills is often spread over the lucern immediately after it has been mown, and much invigorates the next growth; but if the land is rich to a good depth, this is scarcely necessary. The lucern will grow and thrive from seven to twelve years, when it will begin to wear out, and, in spite of weeding, the grass will get the upper hand of it. It should then be ploughed up, all the roots carefully collected and laid in a heap with dung and lime to rot, and a course of regular tillage should succeed. The same land should not be sown with lucern again in less than ten or twelve years, after a regular course of cropping and manuring.

Cattle fed upon lucern thrive better than on any other green food. Horses, in particular, can work hard upon it without any corn, provided it be slow work. Cows give plenty of good milk when fed with it. In spring it is apt to purge cattle, which, with a little attention, is conducive to their health. If it is given to them in too great quantities, or moist with dew, they run the risk of being hoven. These inconveniences are avoided by giving it sparingly at first, and always keeping it twenty-four hours after it is cut, during which time it undergoes an incipient fermentation, and the juice is partially evaporated: instead of being less nutritive in this state, it is rather more so.

An acre of good lucern will keep four or five horses from May to October, when cut just as the flower opens. If it should get too forward, and there be more than the horses can consume, it should be made into hay; but this is not the most profitable way of using it, and the plant, being very succulent, takes a long time in drying. The rain also is very injurious to it in a half-dry state; for the stem is readily soaked with moisture, which is slow in evaporating. The produce in hay, when well made, is very considerable, being often double the weight of a good crop of clover hay.

Many authors recommend drilling the seed of lucern in wide rows, and hoeing the intervals after each cutting. This is the best way with a small patch in a garden, and when only a little is cut every day; but in a field of some extent, the lucern, when once well established and preserved free from weeds by hand-weeding the first year, will keep all weeds down afterwards, and the heavy harrows with sharp tines, used immediately after mowing, will pull up all the grass which may spring up. No farmer ought to neglect having a few acres in lucern on his best land.

LUCERNA'RIA, a genus of soft zoophyta, established by Müller (*Zoologia Danica*). It is much allied to Actinia, Linn., and includes one or perhaps two living species from the North Sea and English Channel. [ZOANTHARIA.]

LUCIA, SAINT, one of the Lesser Antilles, situated in 13° 50′ N. lat. and 60° 58′ W. long., about 40 miles north of St. Vincent. Its extreme length from north to south is 32 miles, and its extreme breadth about 12 miles. This island is of volcanic origin, and several of the mountains terminate at their summits in craters of extinct volcanoes. One of these, called La Souffrière, at the south-west side of the island, has the appearance of a vast lime-pit, and some severe earthquakes, which are still remembered, are attributed to the convulsions within this mountain. Saint Lucia comprises two districts: of one of these, Basseterre, the lowest part is well cultivated, but abounds in swamps and marshes, which have a bad effect on the health of the inhabitants. The other district, called Capisterre, consists of a succession of abrupt fantastically shaped mountains, covered to their summits with forest-trees and underwood, and intersected by numerous ravines containing stagnant water and masses of vegetable matter in every stage of decomposition. Under these circumstances it may well be believed that this island is very unhealthy. It appears from a Report drawn up by Captain Tulloch, of the War-office, and presented to parliament, on the sickness and mortality among the troops in the West Indies, that in the twenty years from 1817 to 1836 the average number of deaths in each year out of each 1000 white soldiers stationed at St. Lucia was 122. The greatest number of deaths occurred in 1822, when 392 out of every 1000 were carried off; the smallest number, 56 in 1000, occurred in 1832. The deaths among the black troops during the same twenty years did not average more than 43 in each 1000, and varied from 75 in 1819 to 12 in 1827. The fort in which the greater part of the troops are stationed is on the summit of a steep hill called Morne Fortuné, about 850 feet above the level of the sea, and having many swamps in the low land in the neighbourhood.

Castries, the only town on the island, lies at the bottom of a long winding bay in a low marshy spot, surrounded by an amphitheatre of hills, which greatly impede ventilation.

The population of the island in 1836 consisted of—

	Males.	Females.	Total.
Whites . .	503	487	990
Coloured persons	6,645	7,695	14,340
Aliens and resident strangers	.	.	786
		Total .	16,116

Of this number about 3300 reside in the town, the rest are located on the plantations throughout the cultivated part of the island. The chief productions are sugar, coffee, and cocoa. In 1835 there were produced of these articles—from 4,087 acres planted with sugar-cane, 5,861,379 lbs. of sugar, 144,684 gallons of molasses, and 101,028 gallons of rum; from 460 acres planted with coffee, 104,888 lbs.; and from 199 acres planted with cocoa, 38,908 lbs.

There were besides 5522 acres cultivated as provision grounds, and 5099 acres of pasture land. The number of stock consisted of 736 horses, 2511 horned cattle, 1668 sheep, and 692 goats.

The total value of imports in 1835 was 51,807*l.*, about three-fourths of which consisted of British manufactures, and about one-fourth of maize, salt fish, and lumber. The exports in the same year were valued at 79,872*l.*, and consisted of the above-mentioned kinds of produce.

St. Lucia is so called from having been first discovered on St. Lucia's day. This was about the year 1635, when a settlement was attempted by a party of English, who were soon after driven off by the Carribs. About 1650, the French effected a settlement. The island was taken in 1664 by the English, but was evacuated by them in 1666, when the French immediately returned, but were in turn driven out by the Carribs. In 1718 the French again succeeded in forming a settlement, and its possession was again disputed by the English. In 1731 the two nations agreed that the island should be evacuated by both. In 1765 England gave up all claim to possession in favour of France, with which country it remained till 1779, when it was taken by the English, but it was restored at the peace of 1783. In 1794 the English again took it, but in the following year the French inhabitants rose upon and overpowered the garrison, and kept possession until May, 1796, when the island was again taken by General Abercromby. At the peace of Amiens it again reverted to France, but was taken once more in 1804 by the English, and has since remained subject to the British crown.

The government is administered by a lieutenant-governor and an executive council. The French laws are nominally in force, but being dispensed by English functionaries, are made to give place to the English practice whenever an adherence to the French code would be contrary thereto.

LUCIAN (Λουκιανός), a celebrated Greek writer, was born at Samosata, a city on the west bank of the Euphrates, in the Syrian province of Commagene. We possess no particulars respecting his life on which any reliance can be placed, except a few scattered notices in his own writings. From these it appears that he was born about the latter end of Trajan's reign, that he lived under both the Antonines, and died in the reign of Aurelius Commodus, or shortly afterwards. His parents, who were in humble circumstances, placed him with his maternal uncle, a sculptor, in order to learn statuary; but he soon quitted this trade, and applied himself to the study of the law. He afterwards practised at the bar in Syria and Greece; but not meeting with much success in this profession, he resolved to settle in Gaul as a teacher of rhetoric, where he soon obtained great celebrity and a numerous school. He appears to have remained in Gaul till he was about forty, when he gave up the profession of rhetoric, after having acquired considerable wealth. The greater part, if not all, of his dialogues appear to have been written after this time; but most of his other pieces, such as his 'Hercules,' 'Hesiod,' 'Herodotus,' 'Zeuxis,' 'Bacchus,' the 'Dipsades,' &c., were probably written during the time that he taught rhetoric in Gaul. During the remainder of his life we find him travelling about from place to place, and visiting successively Macedonia, Cappadocia, Paphlagonia, and Bithynia. The greater part of his time however was passed in Athens, where he lived on terms of the greatest intimacy with Demonax, a philosopher of great celebrity, and where most of his works were probably written. Towards the latter part of his life he held a lucrative public office in Egypt, which was bestowed upon him by the emperor Commodus. The account of his being torn to death by dogs, for having attacked the Christian religion, rests on no credible authority, and was probably invented either by Suidas or some other Christian writer of similar character.

The dialogues of Lucian are written in remarkably pure and elegant Greek, and are free from the false ornaments and artificial rhetoric which characterise most of the writings of his contemporaries. Modern critics have usually given him his full meed of praise for these excellencies, and have also deservedly admired the keenness of his wit, his great talent as a writer, and the inimitable ease and flow of his dialogue; but they have seldom done him the justice he deserves. They have either represented him as merely a witty and amusing writer, but without any further merit; or else they have attacked him as an immoral and infidel author, whose only object was to corrupt the minds of his readers, and to throw ridicule upon all religion. But these opinions appear to us to have arisen from a mistaken and one-sided view of the character of Lucian. He seems to us to have endeavoured to expose all kinds of delusion, fanaticism, and imposture; the quackery and imposition of the priests, the folly and absurdity of the superstitious, and especially the solemn nonsense, the prating insolence, and the immoral lives of the philosophical charlatans of his age. (See his *Alexander*.) Lucian may, in fact, be regarded as the Aristophanes of his age, and, like the great comic poet, he had recourse to raillery and satire to accomplish the great objects he had in view. His study was human character in all its varieties, and the age in which he lived furnished ample materials for his observation. Many of his pictures, though drawn from the circumstances of his own times, are true for every age and country. As an instance of this we mention the essay entitled 'On those who serve the Great for Hire.' If he sometimes discloses the follies and vices of mankind too freely, and occasionally uses expressions which are revolting to our ideas of morality, it should be recollected that every author ought to be judged of by the age in which he lived, and not by a standard of religion and morality which was unknown to the writer. The character of Lucian's mind was decidedly practical; he was not disposed to believe anything without sufficient evidence of its truth; and nothing that was ridiculous or absurd escaped his raillery and sarcasm. The tales of the poets respecting the attributes and exploits of the gods, which were still firmly believed by the common people of his age, were especially the objects of his satire and ridicule in his dialogues between the gods and in many other of his works. That he should have attacked the Christians in common with the false systems of the Pagan religion will not appear surprising to any one who considers that Lucian probably never took the trouble to inquire into the doctrines of a religion which was almost universally despised, in his time, by the higher orders of society. Lucian's statements have sometimes had an historical value assigned to them which he does not appear to have intended: the story of Herodotus reading his history at the Olympic games is one of these. [HERODOTUS.] Lucian had a taste for art, which he has shown by his descriptions in his 'Action,' 'Zeuxis,' 'Eikones,' &c.

The best editions of Lucian's works are by Hemsterhusius, who only edited part of the first volume, and Reiz (4 vols. 8vo.), by Lehmann (Leip., 9 vols. 8vo.), and the edition published by the Bipont Society; the best translation of Lucian in German is by Wieland (6 vols. 8vo.); there is an English translation by Tooke (Lond., 2 vols. 4to., 1820).

LUCIAN, SAINT, presbyter of Antioch, is said by some writers, but without sufficient authority, to have been born at Samosata; he suffered martyrdom during the reign of Diocletian, A.D. 312, and was buried at Helenopolis in Bithynia. He is frequently mentioned by ecclesiastical writers as a man of great learning and piety. Eusebius calls him a 'person of unblemished character throughout his whole life' (*Hist. Eccl.*, viii. 13); and Chrysostom, on *the anniversary* of Lucian's martyrdom, pronounced a panegyric upon him which is still extant. Jerome informs us, in his 'Catalogue of Ecclesiastical Writers' (c. 77), that 'Lucian was so laborious in the study of the Scriptures, that in his own time some copies of the Scriptures were known by the name of Lucian;' and we learn from another part of his works (*Præf. in Paralip.*, vol. i., p. 1023), that Lucian's revision of the Septuagint version of the Old Testament was generally used by the churches from Constantinople to Antioch. Lucian also made a revision of the New Testament, which Jerome considered inferior to his edition of the Septuagint.

There were extant in Jerome's time some treatises of Lucian concerning faith, and also some short epistles; but none of these have come down to us, with the exception of a few fragments.

There has been considerable dispute among critics respecting Lucian's belief in the Trinity. From the manner in which he is spoken of by most of the Trinitarian Fathers, and from no censure being passed upon his orthodoxy by Jerome and Athanasius, it has been maintained by some that he must have been a believer in the Catholic doctrine of the Trinity; but on the other hand Epiphanius, in his 'Anchoret' (xxxv., vol. ii., p. 40, D), speaks of the Lucianists and Arians as one sect; and Philostorgius (who lived about A.D. 425, and wrote an account of the Arian controversy, of which considerable extracts are preserved by Photius) expressly says that Eusebius of Nicomedia and many of the principal Arians of the fourth century were disciples of Lucian. It is probable that Lucian's opinions were not quite orthodox, since he is said by Alexander (in Theodoret, *Hist. Eccl.* i., c. 4, p. 15, B) to have been excluded from the Catholic Church by three bishops in succession, for advocating the doctrines of Paul of Samosata. It is however usually supposed that he returned to the Catholic communion before his death.

LU'CIDA, a name formerly given to the brightest star in any constellation: thus we have Lucida Hydræ, Lucida Lyræ, &c.

LU'CIFER, bishop of Cagliari in Sardinia, is principally known in ecclesiastical history for refusing to hold any communion with the clergy who had, during the reign of Constantius, conformed to the Arian doctrines, although it had been determined in a synod at Alexandria, A.D. 352, to receive again into the church all the Arian clergy who openly acknowledged their errors. In consequence of the decision of the synod at Alexandria, Lucifer eventually left the Catholic church, and his followers are spoken of by ecclesiastical writers as a distinct sect under the name of Luciferians. The number of this sect was always inconsiderable: Theodoret says that it was extinct in his time (*Hist. Eccl.*, iii., c. 5, p. 128, D.) Their opinions however excited considerable attention at the time when they were first promulgated, and were advocated by several eminent men; among others by Faustinus, Marcellinus, and Hilarius. Jerome wrote a work in refutation of their doctrines, which is still extant.

Augustine remarks, in his work on Heresies (c. lxxxi.), that the Luciferians held erroneous opinions concerning the human soul, which they considered to be of a carnal nature, and to be transfused from parents to children.

Lucifer is acknowledged by Jerome and Athanasius to have been well acquainted with the Scriptures, and to have been exemplary in private life; but he appears to have been a man of violent temper and great bigotry. Being banished from Sardinia by Constantius, in consequence of his opposition to the Arian doctrines, he resided for many years in Syria; but after the death of this emperor he returned to his diocese, where he died about A.D. 370.

The writings of Lucifer were published by Tillet, Paris, 1568; they consist of—'Two books addressed to the Emperor Constantius in defence of Athanasius;' 'On Apostate Kings;' 'On the Duty of having no communion with Heretics;' 'On the Duty of dying for the Son of God;' 'On the Duty of showing no mercy to those who sin against God;' and a short Epistle to Florentius.

LUCI'LIUS, CAIUS, was born at Suessa Aurunca (*Sessa*), a town in the north-western part of Campania, B.C. 148. He belonged to the equestrian order, and, by the female side, was grand-uncle to Pompey the Great. In his sixteenth year Lucilius served, together with Marius and Jugurtha, under Scipio Africanus at the siege of Numantia. (Velleius, ii., 9, 4.) He is said to have died B.C. 103, in his forty-sixth year; but the expression of

Horace (*Sat.* ii., 1, 34), in which Lucilius is called *old* (*senex*), seems to imply, as Mr. Clinton has remarked (*Fast. Hell.*, vol. iii., p. 135), that he lived to a later date.

Lucilius is expressly said by Horace (*Sat.* i., 1, 61) to have been the first writer of Roman satire; by which we must not understand that no Roman writer had composed any satirical compositions before him, since the satires of Ennius and others are frequently mentioned by antient authors; but that Lucilius was the first who constructed it on those principles of art which were considered in the time of Horace as essential requisites in a satiric poem. The satires of Lucilius were very popular even in the Augustan age; and to his writings some of the most eminent satirists of antiquity, Horace, Juvernal, and Persius, appear to have been indebted in no small degree for many of their most striking thoughts and expressions.

In addition to his satires, which were divided into thirty books, Lucilius also wrote a comedy entitled 'Numularius,' epodes, and hymns, none of which are extant, with the exception of a few fragments from his satires, which were collected and published by Douza, Leyden, 1597. Scanty as these fragments are, they enable us to form some idea of the style of Lucilius, which appears to have been distinguished by great energy and power of expression, but to have been deficient in elegance and clearness. Horace compares his poetry to a muddy stream, and complains that his versification was rugged and uncouth (*Sat.* i., 4, 8-11); but Quintilian (*Inst. Or.*, x. 1), on the other hand maintains that Horace has not given a fair estimate of the poetry of Lucilius, and that his satires were distinguished by great learning and abundance of wit. Pliny (*Præf. Hist. Nat.*), Cicero (*De Orat.*, i. 16; ii. 6), and Gellius (*N. A.*, xviii. 5), also speak in high terms of the style of Lucilius. Juvenal (i. 20) calls him *magnus Auruncæ alumnus*.

Lucilius attacked vice with such severity, that Juvenal (i. 165) speaks of the guilty as trembling at the vehemence of his rebukes. He did not however confine his satires to the vices of mankind in general, but also attacked private individuals, like the writers of the old comedy among the Greeks, and among other persons, contemporary and preceding poets, as Ennius, Cæcilius, Pacuvius, Accius, &c. (Gell., *N. A.*, xvii. 21.) The powerful protection of Scipio and Lælius, with whom he was on the most intimate terms of friendship (Hor., *Sat.* ii. 1, 70-75), enabled him also to attack with impunity some of the most eminent political characters in Rome; among whom we find the names of Quintus Opimius, conqueror of Liguria, Cæcilius Metellus, and Cornelius Rufus, who was at that time Princeps Senatus.

LUCI'NA (Conchology). [Veneridæ.]

LU'CIUS I. succeeded Cornelius in 252 as bishop of Rome. Little is known of him; he survived his election only a few months; some say he was banished, others that he died a martyr. He was succeeded by Stephen I.

LUCIUS II. succeeded Celestinus II. in 1144, and being wounded by a stone thrown at him in an affray of the people of Rome, died shortly after, and was succeeded by Eugenius III.

LUCIUS III., Cardinal Ubaldo, a native of Lucca, was elected by the cardinals after the death of Alexander III. in 1181, and was consecrated at Velletri, the people of Rome being opposed to him. He died in 1185, shortly after having an interview with the emperor Frederic Barbarossa at Verona. He was succeeded by Urban III.

LUCKNOW, the capital of the kingdom of Oude, stands on the south bank of the Goomty river, in 26° 51′ N. lat. and 80° 50′ E. long. It was a large and populous place in the time of Abul Fazl, but was not made the residence of the court until the accession of Asoph ud Dowlah in 1775, upon which event it was considerably enlarged, and after a few years became one of the wealthiest cities of Hindustan.

Lucknow consists of three distinct quarters: the first, or oldest part, is made up of narrow and dirty streets, and is said to contain at least 300,000 inhabitants; the second quarter consists of one handsome street, with a well-built market-place in the centre, and with smaller streets branching from it at right angles. The greater part of the houses in this quarter are the property of the king, and are occupied by branches of his family or persons attached to the court. A space between this street and the river contains the royal palace and gardens, furnished and laid out in imitation of European fashions. The dwelling of the British resident adjoins the palace. The remaining quarter of the city is built in a purely Oriental style, for which reason it has the most interest for European visitors; it contains many splendid houses and religious edifices, erected by Asoph ud Dowlah, and an unfinished palace begun by Saadet Ali. This is not the only structure in the city which has been left in an unfinished state through a prejudice universally felt by the Mohammedans in India against completing any unfinished undertaking of a deceased person. The English have cantonments to the east of the Goomty, and a few miles distant from Lucknow. Besides the persons connected with the British residency there are many English and other Europeans and their descendants living in the city, who are in the pay of the king of Oude. Lucknow is distant from Benares 189 miles, from Agra 202 miles, from Delhi 280 miles, and from Calcutta 650 miles, all travelling distances.

LUCON. [Vendée.]

LUÇON. [Philippine Islands.]

LUCRETIA. [Brutus, M. J.]

LUCRE'TIUS, with his full name **TITUS LUCRETIUS CARUS**, was born B.C. 95, and died B.C. 52, in the forty-fourth year of his age. We possess no particulars respecting his life, but he appears to have been born at Rome, was probably of equestrian rank, and is said to have put an end to his own life.

The poem of Lucretius, entitled 'De Rerum Natura' (*On the Nature of Things*), contains a development of the physical and ethical doctrines of Epicurus. Notwithstanding the nature of the subject, which gave the poet little opportunity for those descriptions of the passions and the feelings which generally form the chief charm in poetry, Lucretius has succeeded in imparting to his didactic and philosophical work much of the real spirit of poetry; and if he had chosen a subject which would have afforded him greater scope for the exercise of his powers, he might have been ranked among the first of poets. Even in the work which has come down to us we find many passages which are not equalled by the best lines of any Latin poet, and which, for vigour of conception and splendor of diction, will bear a comparison with the best efforts of the poets of any age and country. In no writer does the Latin language display its majesty and stately grandeur so effectively as in Lucretius. There is a power and an energy in his descriptions which we rarely meet with in the Latin poets; and no one who has read his invocation to Venus, at the beginning of the poem, or his beautiful picture of the busy pursuits of men, at the commencement of the second book, or the progress of the arts and sciences in the fifth, or his description of the plague which devastated Athens during the Peloponnesian war, at the close of the sixth, can refuse to allow Lucretius a high rank among the poets of antiquity.

The object of Lucretius was to inculcate the great doctrine of Epicurus, so frequently misunderstood and misrepresented, that it is the great object of man's life to increase to the utmost his pleasures, and to diminish to the utmost his pains; and since the happiness of mankind was chiefly prevented, in his opinion, by two things, superstition, or a slavish fear of the gods, and a dread of death, he endeavours to show that the gods take no interest in and exercise no control over the affairs of mankind, and that the soul is material and perishes with the body. In the first three books he develops the Epicurean tenets respecting the formation of all things from atoms which existed from all eternity; and also maintains the materiality of the soul, which he supposes to be compounded of different kinds of air inhaled from the atmosphere; in the fourth book he inquires into the origin of sense and perception, and the nature and origin of dreams, which leads to a long digression on the folly and miseries of unlawful love; in the fifth he gives an account of the origin and laws of the world, and describes the gradual progress of mankind from a state of nature to civilization, as well as the origin and progress of the arts and sciences; and in the sixth he attempts to account for a number of extraordinary phenomena, such as waterspouts, hurricanes, earthquakes, volcanoes, and pestilential diseases.

The poetry of Lucretius does not appear to have been highly estimated by the majority of his countrymen. Ovid certainly speaks of it in the highest terms (*Amor.*, xv. 23); but Quintilian mentions him rather slightingly (*Inst. Orat.* x. 1); and Cicero does not praise him without considerable reservation (*Epist. ad Quint.*, ii. 11). The nature of his subject and the little taste which the Romans in general manifested for speculations like those of Lucretius, may perhaps account for his poetry being estimated below its real merits.

In modern times the ‘De Rerum Natura’ has been frequently attacked on account of its philosophical doctrines; and among the works that have been written against it is a long Latin poem, not without considerable merit, by the Cardinal Polignac, entitled ‘Anti-Lucretius, sive de Deo et Natura,’ in nine books, addressed to Quintius, an atheist.

The best editions of Lucretius are, by Lambinus, whose commentary is very useful, 1563, 1570; Havercamp, 1725; Wakefield, 1796-97; Eichstädt, 1801; and Forbiger, 1828. The ‘De Rerum Natura’ has been translated into most European languages; the translations most worthy of notice are, the English by Creech (frequently printed), and by Mason Good, with the Latin text, and numerous notes of little value, in 2 vols. 4to., 1805; the French by Lagrange, with the Latin text, 1799; the German by Meinecke, 1795, and by Knebel, 1821; and the Italian by Marchetti, 1717, frequently reprinted.

LUCRINE LAKE. [AVERNO.]

LUCU'LIA, a genus of the natural family of Rubiaceæ, suborder Cinchonaceæ, tribe Cinchoneæ, and subtribe Eucinchoneæ, thus indicating the close affinity of this genus to that of the trees yielding Peruvian bark, or true Cinchonas, in which indeed the only known species, *L. gratissima*, was placed by Dr. Wallich and figured in his ‘Tent. Fl. Nepal,’ t. 21. It is found in great abundance on Nag-Urjoon and some of the other smaller hills in the Valley of Nepal; also at Bechiaco and Koolakan. It delights in exposed, rather naked situations, blossoming, according to the situations where it is found, nearly the whole year round. It is also found on the Pandooa Hills in Silhet, flowering in the month of September. As seen by Dr. Wallich it attains a height of sixteen feet, but he was informed of its growing to a larger size. It has been introduced into and has flowered in this country; but from the nature of the climate where it is indigenous, it is only suited to the greenhouses of England. Its locality and affinity are interesting, particularly when coupled with the prevalence in the same mountains of two other genera, Hymenodictyon and Hymenopogen, belonging to the same subtribe Eucinchoneæ, and therefore equally allied to the true Cinchonas; all indicating the part of the Indian territory where these valuable plants might most certainly be grown, and yield a profitable article of commerce. ‘It is impossible to conceive anything more beautiful than this tree, when covered with its numerous rounded panicles of pink-coloured, very fragrant, large blossoms.’ (Wallich, l. c., p. 30.)

LUCULLUS, LU'CIUS LICI'NIUS, descended from a distinguished Roman family, was born about B.C. 115, and served under Sulla in the Marsian war. Sulla had a very high opinion of the talents and integrity of Lucullus, and employed him, though he was very young, in many important enterprises. Whilst Sulla was besieging Athens (B.C. 87), Lucullus was sent into Egypt and Africa to collect a fleet; and after the conclusion of the war with Mithridates, he was left in Asia to collect the money which Sulla had imposed upon the conquered states. So great was the regard that Sulla had for Lucullus, that he dedicated his Commentaries to him, and in his last will made him guardian to his son.

In B.C. 74, Lucullus was elected consul, and was appointed to the command in the war against Mithridates. During the following eight years he was entirely engaged in conducting this war; and in a series of brilliant campaigns completely defeated Mithridates and his powerful son-in-law Tigranes. In B.C. 73 he defeated Mithridates at Cyzicus on the Propontis, and in the following year again conquered him at Cabiri, on the borders of Pontus and Armenia. In B.C. 69 he marched into Armenia against Tigranes, who had espoused the cause of his father-in-law; and completely defeated his forces near Tigranocerta in Armenia. He followed up his victory by the capture of Tigranocerta, and in the following year also took Nisibis in the north part of Mesopotamia; but was not able to derive all the advantages he might have done from his victories, in consequence of the mutinous disposition of his soldiers. Lucullus never appears to have been a favourite with his troops; and their disaffection was increased by the acts of Clodius, whose sister Lucullus had married. The popular party at home were not slow in attacking a general who had been the personal friend of Sulla, and who was known to be a powerful supporter of the patrician party. They accused him of protracting the war on account of the facilities it afforded him of acquiring wealth; and eventually carried a measure by which he was removed from the command, and succeeded by Pompey, B.C. 66.

The senate, says Plutarch, had looked forward to Lucullus as likely to prove a most powerful supporter of the patrician order; but in this they were disappointed; for Lucullus on his return to Rome took no part in public affairs, and passed the remainder of his life in retirement. The immense fortune which he had amassed during his command in Asia he employed in the erection of most magnificent villas near Naples and Tusculum; and he lived in a style of magnificence and luxury which appears to have astonished even the most wealthy of his contemporaries. Lucullus was a man of refined taste and liberal education; he wrote in his youth the history of the Marsian war in Greek (Plutarch, *Luc.*, c. i.; compare Cic. *Ad Att.*, i. 12), and was a warm supporter of learning and the arts. His houses were decorated with the most costly paintings and statues, and his library, which he had collected at an immense expense, was open to all learned men. He lived on intimate terms with Cicero, who has highly praised his learning, and inscribed one of his books with the name of his friend, namely, the fourth book of his ‘Academical Questions,’ in which he makes Lucullus defend the philosophical opinions of the Old Academy.

It is said that during the latter years of his life Lucullus lost his senses, and that his brother had the care of his estate.

(Plutarch's *Life of Lucullus*; Livy's *Epitomes*; Appian's *Mithridatic War*; Cicero's *Acad. Quæs.*, iv.; Clinton's *Fasti Hellenici*.)

LUDLOW, a corporate town and parliamentary borough of Shropshire, 138 miles north-west by west from London. It is locally within the hundred of Munslow, and is agreeably situated on the eastern bank of the Teme, a branch of the Severn, over which river there is a handsome stone bridge of three arches. The charters date from the first year of the reign of Edward IV. to the first of James II. The property of the corporation consists chiefly of houses and lands in Ludlow and its immediate vicinity. The income derived from this source amounted, in the year ending September 29, 1833, to 3010*l.*; the expenditure during the same period was 2476*l.* The town council is composed of four aldermen and twelve councillors.

The streets of Ludlow are broad, well paved, and lighted with gas, and the houses are in general well built. The inhabitants are amply supplied with water, which is partly drawn from three springs situated about a mile and a half from the town, and thence conveyed in leaden-pipes, and partly raised by machinery from the river Corve. The ordinary police, consisting merely of the chief constable and eight others appointed by the leet, is said to be effective. The borough gaol, erected in 1764 at the expense of the corporation, is commodious, and contains separate wards for the classification of the prisoners. The manufacture of gloves was formerly on a large scale, but of late years it has much declined, in consequence, it is said, of the competition of the manufacturing towns of Liecestershire and Nottinghamshire. The parish church, dedicated to St. Lawrence, is in the diocese of Hereford, and the living, a rectory in the patronage of the crown, is valued at 160*l.* per annum.

The free grammar-school, founded by Edward VI., is conducted by a master and usher, whose salaries are respectively 100*l.* and 60*l.* All boys duly qualified by residence within the borough, and able to read tolerably, are admitted upon application. The number of free scholars in 1835 was under thirty. Besides the grammar-school, there is the national school, connected with the church, which is liberally supported by voluntary donations, and affords instruction to 100 girls and 150 boys. There are also two schools established by the Independents and Wesleyan Methodists, which are numerously attended. In 1831 the population of the borough was 5253. Ludlow has returned two members to parliament continuously from the reign of Edward IV. (*Boundary Reports*; *Municipal Corporation Reports*, &c.)

LUDLOW ROCKS. The upper part of the ‘Silurian system’ of Mr. Murchison is thus designated. They include the following three terms:—

Upper Ludlow Rock.—A thick mass of laminated arenaceous deposits, seldom acquiring considerable hardness, and suggesting the notion of having been deposited as a muddy sediment; from which circumstance it has also been called 'mudstone' by Mr. Murchison. Very rich in fossils.

Aymestry Limestone.—A concretionary and polypiferous limestone, of local occurrence and small thickness, merely separating the other terms. Many fossils.

Lower Ludlow Rock.—Chiefly an argillaceous, shaly, and flaggy deposit, with a few calcareous nodules, yielding shells.

The limestone of Wenlock and Dudley lies below.

LUDLOW, EDMUND, was born at Maiden-Bradley in Wiltshire, about the year 1620. His father, Sir Henry Ludlow, a considerable landed proprietor in that county, and its representative in the Long Parliament, was an advocate of the democratic cause, which was likewise eagerly espoused by his son. Edmund Ludlow volunteered in Essex's army, and first engaged the king's forces at the battle of Edge-hill (1642): from this time, with only occasional interruptions, he filled such stations, military or civil, as rendered him an important partisan. He denounced the misgovernment of the king, and sought the destruction of the monarchy and the establishment of a commonwealth. He was one of the most active assistants in Col. Pride's purge, one of the foremost of the king's judges, and one of the most eager voters for the annihilation of the House of Peers. His independence rendered him obnoxious to Cromwell, who, to impair his influence, sent him to Ireland with a military command (1650), an expedient which must be acknowledged to have been most politic; for when Cromwell assumed the authority of Protector, Ludlow loudly protested against his elevation, and if he had been in England might possibly have impeded it. Consistent in his advocacy of an equal commonwealth, he refused, when he left Ireland, to yield Cromwell an unqualified submission. He was regarded with great jealousy on account of this refusal, and security was required that he should not act in hostility to the government. His brother, Thomas Ludlow, privately furnished the security, and Ludlow retired into Essex, where he resided until Oliver Cromwell's death. He then resumed his public course; was active in parliament in the Committee of Safety, in the council of state, and again received a command of troops in Ireland. Accusations were afterwards brought against him by the council of officers; he was called an opponent of the interests of the army, and charged with high treason. In consequence of these charges he travelled to London, resumed his seat in parliament, and there offered to enter on his defence; but such was the state of confusion at this time, Monk and his forces being daily expected in London, that he was neither heard nor were the proceedings against him advanced any further. When the king was restored, Ludlow, justly estimating his insecurity, fled the country; and after narrowly escaping capture, landed at Dieppe, in September, 1660. From Dieppe he went to Switzerland, and having visited Geneva and Berne, resided principally at Vevay. In 1689, wearied with exile, he returned to England, hoping that his offences as a republican were either forgotten or forgiven; but he was disappointed; an arrest was threatened, and he was compelled again to fly to Vevay, where he died in 1693, aged seventy-three years. His memoirs were written in Switzerland, and first printed at Vevay, two volumes in 1698, and a third in the following year. (Ludlow's *Memoirs*.)

LUDOLPHUS, JOB (the Latinized form of his real name Leutholf), was born at Erfurt, the 15th June, 1624, and was educated at the university of Leyden, where he principally studied jurisprudence and the Oriental languages. After leaving Leyden, he remained for some time in Paris as tutor to the sons of the Swedish ambassador. In 1652 he removed to the court of the duke of Saxe-Gotha, in order to superintend the education of the duke's children. During the latter part of his life he resided at Frankfort-on-the-Main, where he died on the 8th April, 1704.

Ludolph was one of the most eminent Oriental scholars of his age, and appears to have been the first European who acquired a knowledge of the Ethiopic language, which he learnt with the assistance of a native of Abyssinia. He published at London, in 1661, a dictionary and grammar of this language; but a much improved edition of the dictionary appeared at Frankfort in 1698, and of the grammar in 1702. Ludolph also paid great attention to the Amharic language, of which he published a dictionary and grammar in 1698.

The most important of Ludolph's other works are: 'Historia Æthiopica, sive Descriptio Regni Habessinorum, quod vulgo male Presbyteri Johannis vocatur,' Frankfort, 1681; 'Ad Historiam Æthiopicam Commentarius,' Frankfort, 1691 (there is an English edition of the 'History of Ethiopia'); 'Relatio Nova de hodierno Habessiniæ statu ex India nuper allata,' Frankfort, 1693; 'Appendix Secunda ad Historiam Æthiopicam, continens Dissertationem de Locustis,' Frankfort, 1694; 'Epistola Æthiopice ad universam Habessinorum gentem scripta,' Frankfort, 1683; 'Epistolæ Samaritanæ Sichemitarum ad Ludolphum,' with a Latin translation and notes, 1688; and a translation of the Psalms into Ethiopic, Frankfort, 1701.

LUGANO. [TICINO.]

LUGO. [GALICIA.]

LUKE, ST., the Evangelist. Respecting the birth and early life of this evangelist we have no certain information; of his later history we learn something from his own work, the *Acts of the Apostles*. [APOSTLES, ACTS OF.] A considerable knowledge of the Greek language is displayed in his writings, especially in the introduction to his Gospel, which is written in elegant Greek. On the other hand, his language contains many Hebraisms, and he was evidently well acquainted with the religious rites of the Jews, whose mode of computing time he follows. (*Luke*, xxii. 1; *Acts*, ii. 1; xii. 3, 4; xx. 6, 16, &c.) Hence it has been much disputed whether he was a Jew or a Gentile before he embraced Christianity. The difficulty is best explained by the opinion of Bolten, confirmed by a tradition current in Jerome's time, that Luke was a Greek by birth, but became a proselyte to Judaism early in life. This opinion is supported by *Acts*, xxi. 28-31, and *Coloss.*, iv. 11, 14. From the former passage we learn that the Jews accused Paul of defiling the temple by bringing into it a Greek, Trophimus of Ephesus. Luke was then with Paul (*Acts*, xxi. 17, 18), and the accusation would have regarded him also, if he had not been looked upon as a Jew *by religion*. In the latter passage Paul distinguishes Luke from other individuals 'who are of the circumcision,' which seems to show that Luke was not a Jew *by birth;* unless indeed the Luke here mentioned be another individual, which we have no reason to suppose. Of the period of his conversion to Christianity we know nothing. Cave and Mill have supposed that he was converted by Paul at Antioch; but they are not supported by any antient writer: nor is it likely that Luke would have passed over such an event in writing the *Acts*.

From the passage quoted above (*Col.*, iv. 14), and from the testimony of Eusebius, Jerome, and other early writers, it appears that Luke was a physician. Another tradition makes him a painter, but this statement is generally allowed to deserve no credit; and the opinion of Grotius and Wetstein, that he was a slave during part of his life, seems equally unfounded.

Luke's native country is unknown. Eusebius and Jerome say that he was a native of Antioch; but this statement is not found in Irenæus, Clement, Tertullian, or Origen, nor in any writer before the time of Eusebius. Eichhorn has conjectured that this tradition arose from confounding the Evangelist with Lucius of Cyrene, who is mentioned as living at Antioch, in *Acts*, xiii. 1. Many writers however entertain the opinion, which is as old as the time of Origen, that this Lucius and the evangelist Luke were the same person. This conjecture is ably maintained by Mr. Charles Taylor, the editor of Calmet.

Some early writers, but of no very high authority, affirm that Luke was one of the seventy disciples sent forth by Christ, whose mission he alone of the Evangelists records. (*Luke*, x.) Others mention him as the companion of Cleopas in the journey to Emmaus, recorded in *Luke*, xxiv. 13. It is alleged that the mention of Cleopas, while his companion's name is withheld, the fullness and general character of the narrative, and especially the notice of minute circumstances which none but an eye-witness could record, prove that the traveller was the Evangelist himself. Other reasons are adduced for believing him to have been in Jerusalem at this time; namely, that the latter part of his Gospel and the earlier chapters of the *Acts* have every mark of being written by an eye-witness of the facts he narrates, and that all the appearances of Christ after his resurrection mentioned by him took place in the neighbourhood of Jerusalem. To this it is objected that we can only understand t preface to his Gospel (i. 1-4) as a distinct assertion t St. Luke was not an eye-witness himself, but that he rived his information from others who were eye-witnesse

In *Acts*, xi. 28, the Cambridge MS. has a various reading, 'and when we were gathered together, there stood up,' &c., which, if admitted, would prove that Luke was connected with the Church at Antioch about A.D. 42: but this reading is not usually accounted of any great authority.

The first distinct mention of Luke in the New Testament is in *Acts*, xvi. 10, 11, where, in relating the vision which Paul saw at Troas, the writer suddenly begins to use the first person plural, whence it is inferred that Luke here joined the Apostle (about A.D. 53), whom he accompanied to Philippi (ver. 12). He seems to have remained at Philippi during Paul's journey to Athens and Corinth; for he drops the first person at ver. 17, and does not resume it till he relates Paul's return to Philippi (xx. 5, 6). From this time it appears from the *Acts* that Luke was Paul's constant companion till his arrival at Rome (about A.D. 61 or 63), where he remained with the Apostle for some time, probably during Paul's first imprisonment. He is mentioned more than once in Paul's Epistles written during this period. (*Col.*, iv. 14; 2 *Tim.*, iv. 2; *Philem.*, v 24.) Some suppose him to be 'the brother whose praise is in all the churches,' mentioned in the Epistle to the Corinthians (viii. 18; xii. 18). Besides his intimacy with Paul, he is said by Irenæus, Eusebius, Jerome, and other early writers, to have had a considerable acquaintance with the rest of the Apostles: indeed, they often speak of Luke and Mark as disciples of the Apostles, as distinguished from John and Matthew, who were disciples of Christ.

Respecting the end of Luke's life, the tradition is, that after Paul's liberation from his first imprisonment, he retired to Achaia, where he resided some few years, wrote his Gospel and the Acts of the Apostles, and died at an advanced age (some say 80, others 84 years), probably by a natural death, as we have no mention of his martyrdom.

LUKE, ST., THE GOSPEL OF, is a narrative of the life of Jesus Christ, written by the evangelist Luke, and one of the canonical books of the New Testament.

The genuineness and authenticity of this Gospel are attested by the unanimous voice of the early Christian writers, and confirmed by internal evidence, and by the passage in *Acts*, i. 1, compared with this Gospel, i. 4. Michaelis has indeed objected to its canonical authority, and to that of St. Mark's Gospel also, chiefly on the ground that these books are not the production of Apostles. But such an argument cannot be admitted in opposition to the universal opinion of the primitive Christians, nor have we any proof that inspiration was confined to the Apostles. The genuineness of parts of the Gospel has been called in question, especially of the 1st and 2nd chapters. But these chapters, being in all existing MSS., are supported by a weight of external evidence which no internal difficulties can overthrow.

Many of the early writers state that St. Luke composed his Gospel under the superintendence of St. Paul. Irenæus says that 'Luke put down in a book the gospel preached by Paul;' Tertullian, that 'Luke's digest is often ascribed to Paul.' In all probability St. Luke would not neglect St. Paul's assistance in so important a work, but the idea that the Gospel is really St. Paul's, and that St. Luke was little more than his amanuensis, is not sustained by any striking agreement in the style of the two writers.

The most probable date of St. Luke's Gospel is about A.D. 63 or 64. It is closely connected with the Acts of the Apostles, and was probably written not long before that book. (*Acts*, i. 1.) Some writers place it in A.D. 53. Theophylact asserts that it was written fifteen years after Christ's ascension.

With respect to the place of its composition the common tradition is that it was written in Greece; Jerome says in Achaia and Bœotia.

Like the Acts of the Apostles, this Gospel is dedicated to Theophilus. The conjectures of critics respecting this personage are as numerous as is usual on such points; the conclusion at which Kuinoel arrives is that he was a converted Gentile, living without the bounds of Palestine. This dedication, the testimony of early writers, and some marks in the work itself, such as the explanations given of matters exclusively Jewish, prove that the Gospel was designed for the benefit of Gentile converts.

The contents of this Gospel are not arranged, like those of St. Matthew and St. Mark, in chronological order, but rather according to the subjects. Schleiermacher has proposed the following classification :—

1. The interval preceding the public life of Jesus, chaps. i. and ii.
2. Narratives of actions and discourses of Jesus, chiefly at Capernaum and its neighbourhood. Chaps. iii. to ix. 39.
3. Similar narratives, relating mostly to a journey of Christ to Jerusalem. The exact end of this division is doubtful.
4. The last days of Christ, his sufferings and death, and his resurrection and ascension.

The qualifications of St. Luke for the task he undertook were very high. He was evidently a well-educated man; perhaps he was an eye-witness of many of the events he relates; and assuredly he had excellent opportunities of gaining information from eye-witnesses. He assures us that he had 'accurately examined all matters from the very first' (παρηκολουϑηκότι ἄνωθεν πᾶσιν ἀκριβῶς, i. 3); and his assertion is borne out by many marks of care and accuracy which appear in his narrative. In both his works he is scrupulously minute with respect to dates and numbers (see for example *Luke*, iii. 1); and he has taken the trouble to insert copies of important documents and accurate reports of speeches. The examples of the latter are very numerous; of the former we have a striking instance in the letter of Lysias to Felix. (*Acts*, xxiii. 26.) It will not indeed appear improbable to an attentive reader of this evangelist, especially in the account of Paul's voyage from Cæsarea to Rome, that he was in the habit of keeping a journal of events, which he used in composing his histories.

The controversy concerning the sources of this Gospel and those of St. Matthew and St. Mark has been alluded to under GOSPEL. A full account of the theories framed on this subject will be found in the Appendix to the fourth volume of Horne's 'Introduction.'

(Lardner's *Credibility*, and *Lives of the Apostles and Evangelists;* Cave's *Lives of the Apostles and Evangelists;* Kuinoel, *Comment. in Lib. Hist. N. T. Proleg. in Luc.;* Calmet's *Dictionary to the Bible*, by Charles Taylor; the *Introductions* of Michaelis (by Bishop Marsh), Hug, Horne, and Eichhorn; and Schleiermacher's *Critical Essay on the Gospel of Luke*, with Introduction by the Translator.)

LULEA-ELF. [BOTHNIA.]

LULLY, RAYMUND, surnamed the Enlightened Doctor, an enthusiastic and remarkable character of the thirteenth century, was born at Palma, in the island of Majorca, in 1234. In early life he followed his paternal profession of arms in the service of the king of Aragon, and abandoned himself to all the licence of a soldier's life. Passing from extreme to extreme, Lully subsequently retired to a desert, where he pursued a life of solitude and rigorous asceticism. Here he pretended to have had visions, and, among others, a manifestation of Christ on the cross, who called him to his service and the conversion of the Mohammedans. Hereupon he divided all his property among the poor; and in his thirtieth year he began to prepare himself, by diligent study, for the labours and duties of a missionary. Learning Arabic from a slave, he read in that language several philosophical works, the perusal of which, in all probability, suggested those new views of grammar and dialectic by means of which he hoped to reform science, and thereby the world itself. Full of this idea he had a second vision of the Saviour in the semblance of a fiery seraph, by whom he was expressly enjoined to commit to writing and to publish the treatise, to which he himself gave the name of 'Ars Lullia,' but which his followers and admirers dignified by the title of the 'Great Art' (Ars Magna). Having besought James of Aragon to establish a monastery in Majorca for the education of thirteen monks in the Arabic language and the duties of missionaries, he went to Rome to seek the countenance of Pope Honorius IV. for similar institutions and his own mission. Receiving however little encouragement, he visited Paris and Genoa with the same design, and with similar success. From Genoa he crossed to Africa, where he was in danger of losing his life in consequence of his dispute with a Mohammedan whom he sought to convert, but was saved by the intercession of an Arabian mufti, on the condition of quitting Africa for ever. This promise however he subsequently considered not to be binding upon him; for after revisiting Italy, and in vain seeking to excite sympathy and co-operation in his designs, he reasssumed, unassisted, his enthusiastic enterprise. Proceeding first to Cyprus and thence to Africa, he was nearly stoned to death; and being cast into prison, owed nis liberty to the generosity of some Genoese merchants. Upon his return to Europe Lully visited its principal cities, preaching the necessity of a crusade for the recovery of the Holy Land, a plan of which he laid before Pope Clement V., by whom it was received with little or no favour. Unchecked however by so many disappointments, and with the ardour of his enthusiasm still unabated, Lully returned a third time to Africa, where his zeal for conversion entailed upon him dreadful torments, from which he was a second time rescued by the generosity of the Genoese. The sufferings however to which he had been exposed were so great, that Lully died on his passage home when he was just within sight of his native country, in the year 1315.

The 'Ars Magna Lulli, or the Lullian Art,' which found a few admirers, who styled themselves Lullists, after its inventor, and was subsequently revived and improved by the celebrated Giordano Bruno, is an attempt to give a formal arrangement of all ideas, with a view as well to facilitate instruction as to systematise knowledge. The means which this logical machine employs are:—1, letters (alphabetum artes), which stand for certain general terms common to all sciences, but especially to logic, metaphysics, ethics, and theology; 2, figures, viz.—triangles, squares, and circles, which indicate the relations of those general terms; and 3, sections (cameræ), in which the combinations of these ideas or terms are formed by the adjustment of the figures. In the angular spaces of the triangles and squares certain predicates are inscribed, and certain subjects on the circles. On the circle of subjects, the triangles of the predicates being so fixed as to move freely, every possible combination of ideas is supposed to be produced by their revolution, according as the angular points successively pass before the letter inscribed on the margin of the circle. Hence arise definitions, axioms, and propositions, which vary infinitely according to the different application of general or particular predicates to particular or general subjects. As however the ideas which are selected for the fundamental notions of this mechanical logic are purely arbitrary, the knowledge to which it professes to lead must be narrow and limited, and at best it does but furnish a few laws of universal notions for analysis and combination. Nevertheless as the invention, weak as it is, was founded on a feeling of the inadequacy of the dialectic of the schools, and as it furnished a weapon for its opponents, the name of Raymund Lully has been gratefully placed on the list of the reformers of philosophy. In his personal character he seems to claim more justly our admiration for the iron resolution with which, late in life, and for the most part unassisted, he applied himself to the study of science and philosophy, and for the steady resolution with which he persevered in his scheme of converting the heathen in despite of all discouragements and disappointment.

The works of Lully have been edited by Salzinger, 'Raymondi Lullii opera omnia,' in 10 vols. fol., Mayence, 1721-42.

LULLY (or LULLI), JEAN-BAPTISTE, the father of French dramatic music, was the son of a miller, and born at Florence in 1633. Showing in his infant years a strong propensity for music, a kind-hearted monk taught him the use of the guitar, an instrument then as common in Italy as it is now in Spain. Having attracted the notice of the Chevalier Guise, he was by that nobleman recommended to Mademoiselle de Montpensier, niece of Louis XIV., as a page, and sent to Paris in his fourteenth year. But his ready wit and talent found no favour in the eyes of the princess, for they were not set off by either a good figure or a pleasing countenance. Instead therefore of becoming the bearer of the lady's fan, or perhaps of her confidential communications, he was placed in the kitchen, and commenced his life of activity in the humble capacity of *marmiton*, or scullion. This degradation however did not much discourage him. He had previously acquired some knowledge of the violin, and now dedicated every spare moment to it. His devotion and industry were crowned with success. The report of his skill quickly ascended to the apartments of the princess, who placed him under an able master, and he soon was numbered among the king's twenty-four violins. He now aspired to the rank of composer, and having produced some airs which 'with ravished ears the monarch heard,' he was individually summoned into the royal presence, commanded to perform himself the compositions which had excited so much pleasure, and from that moment the road to promotion and honour was opened to him. He was immediately placed at the head of a new band, denominated *Les Petits Violons*, which soon eclipsed the famous *bande des vingt-quatre*.

Lully now was engaged to write music for the *Ballets*, entertainments of a mixed kind much admired at court. But Louis, ambitious of rivalling the grand opera not long before established at Venice, and encouraged in his design by the Cardinal Mazarin, founded, in 1669, the *Académie Royale de Musique*, an institution which has ever since continued to flourish. At the head of this, Lully, who had been appointed *Surintendant de la Musique de la Chambre du Roi*, was soon placed, and being associated with Quinault, the admirable lyric poet, carried into effect the king's wishes to their utmost extent. His abilities and exertions were not, as is too usual, suffered to remain unrewarded: besides the glory of complete success, he acquired a handsome fortune, and was raised to the honourable rank of *Secrétaire du Roi*. The proud *Secrétaires* hesitated at admitting a *marmiton* into their number. Lully complained to the king. 'I have honoured them, not you,' said the monarch, 'by putting a man of genius among them.'

On the recovery of Louis from a severe operation, Lully composed a *Te Deum*, and during a rehearsal of it, while beating the time to the band with his cane, he struck his foot a violent blow, which was followed by serious consequences, and having put himself into the hands of a quack, his life paid the forfeit of his credulity. He died in Paris, in 1687, where, in the church *des Petits Pères*, his family erected a splendid monument to his memory. In his last illness he was attended by a priest, who refused him the consolations of the church, unless he consented to destroy the opera on which he was engaged. He complied: the manuscript was committed to the flames. A friend, entering shortly after, reproached him for having listened to a dreaming Jansenist. 'Hush! hush!' whispered the composer, 'I have another fair copy of the work in my drawer.'

Lully was a shrewd man, possessing a considerable fund of humour, and many pleasant anecdotes are related of him. His companionable qualities led him too much into company, which he did not enjoy in a temperate manner, and the serious turn which the accident just mentioned took was imputed to the bad state of body produced by his habitual indulgences. As a composer, he is to be ranked among the first in his art. To him music is indebted for some of its greatest improvements, and his works display genius of a high order tempered by the soundest judgment. Even Handel acknowledged that he modelled his overtures after those of Lully; and our illustrious Purcell did not hesitate to profit by many hints afforded by the nineteen operas composed by the favourite of *Louis le Grand*.

LUMBA'GO. [RHEUMATISM.]

LUMBRI'CUS. The genus *Lumbricus* of Linnæus consisted not only of the *Earth-worms*, properly so called, but of an Intestinal worm or *Entozoon* (var. Intestinalis γ), the *Ascaris lumbricoides*, which so often infests children, and the *Lumbricus marinus* or *Lug* of our shores, so much in request by fishermen as a bait for sea-fish. The genus, as he left it, comprised only the two species *terrestris* and *marinus*, and is arranged under his *Vermes* (Intestina), between *Ascaris* and *Lumbricus*.

Lamarck and Cuvier both place the genus *Lumbricus* among the Annelids.

The former makes the *Echiurées* or *Lombricinés* the second family of his *Apod Annelids*. He observes that they have in truth projecting bristles (soies) externally; but these bristles, rarely fasciculated, are not retractile, have no sheath, nor are they furnished with pediform mamillæ, serving as a case for bundles of retractile bristles, as in all the Annelids of Lamarck's two following orders, the *Antennate Annelids* and the *Sedentary Annelids*.

Lamarck states that he formed this family at the expense of the genus *Lumbricus* of Linnæus, or rather of a part of that genus; but he adds that, in the then imperfect state of the knowledge of their internal organization, he considers his labours as imperfect and provisional only. He assigns to this family as a habitat moist earth and the mud or sand (vase) of the sea, and states that their branchiæ are not known. The three genera placed by him under this family are *Lumbricus*, *Thalassema*, and *Cirratulus*. To these the editor of the last edition adds *Sternapsis*, and expresses his opinion that Savigny's genus *Ophelia* ought to be arranged near *Cirratulus*.

Cuvier makes the *Abranchiata* (Les Abranches) the third order of the Annelids, and the *Setigerous Abranchiata* (Abranches Sétigerès, ou Pourvues de soies) the first order of that family. The order consists of the genera *Lumbricus* and *Nais*. It is to the first of these genera that we are to call the attention of the reader, and it is characterized by a long cylindrical body divided by wrinkles into a great number of rings, and by a mouth without teeth. Cuvier remarks that the *Lumbrici* ought to be subdivided; and Savigny has, in effect, subdivided the Earth-worms into the genera *Enterion*, *Hypogæon*, and *Clitellio*. MM. Audouin and Milne Edwards distinguish also the genus *Trophonia*.

Of these *Enterion* has upon each ring four pairs of small bristle-like processes, eight in all.

Clitellio is stated to have two bristle-like processes only on each ring.

Hypogæon has, besides the other bristle-like processes, one on the back of each ring. (This form is noticed as being American only.)

Trophonia has on each ring four bundles of short bristle-like processes, and at the anterior extremity a great number of long and brilliant bristle-like processes which surround the mouth.

Savigny described upwards of twenty species, which he considers to be distinct, and to have been confounded previously under the name of *Lumbricus terrestris*. M. Morren, in his 'Treatise on the Natural History and Anatomy of the *Lumbricus terrestris*' (Brussels, 1829), appears to be doubtful with regard to the number of species described by Savigny and others, and inclines to the opinion that they are merely varieties. M. Milne Edwards (edit. of Lamarck's *Animaux sans Vertèbres*, 1838) considers the characters on which Savigny relied as distinctions for dividing the group into the three genera as of little importance.

We take as an example the *common Earth-worm* (*Lumbricus terrestris* of Linnæus).

ORGANIZATION.

Eternally the Earth-worm presents a body composed of numerous narrow rings closely approximated to each other; at about one-third of their length may be seen, particularly at the season of reproduction, the *clitellum*, which becomes at that time a highly important agent. The colour of the body is reddish or bluish, and of a shining aspect, and the animal has the power of secreting a viscous substance, which forms a sort of protecting sheath to its body, and greatly facilitates its progress through the earth. The animal is eyeless, and unprovided with either tentacles, branchiæ, or cirrhi.

Respiratory System.—The generally received opinion is that the blood of the Earth-worms is aërated by means of lateral series of small pyriform vesicles, analogous to the breathing sacs of the Leech [LEECH, vol. xiii., p. 382], and opening externally by very minute pores.

Digestive System.—The mouth consists of two lips without tentacles or armature of any description; but the upper lip is elongated and proboscidiform. The œsophagus, which is a wide membranous canal, is continued straight down for half an inch, and ends in a dilated bag or reservoir, to which succeeds a muscular stomach or gizzard, disposed in the form of a ring. The intestine is constricted at each segment of the animal by a series of ligaments or partitions, connecting it to the parietes of the body, and swells out the intermediate spaces, when distended by the particles of earth. (See the *Catalogue of the Physiological Series of Comparative Anatomy in the Museum of the Royal College of Surgeons in London*, vol. i., and the preparation in the Gallery, No. 470.)

Nervous System.—The nervous system of the Earth-worm consists of a series of small ganglions close to each other. In the Museum of the College of Surgeons is a preparation, No. 1296 (*Gallery, Phys. Series*), illustrative of this system. It is an Earth-worm (*Lumbricus terrestris*, Linn.) with the ventral parietes of the abdomen removed to show the nervous chords, their ganglions, and lateral branches. The divergence of the two main lateral chords, in order to pass to the dorsal aspect of the œsophagus, is clearly shown (*Cat.*, vol. iii., part 1).

Generative System.—Allotriandrous, or with male organs so disposed as to fecundate the ova of a different individual. (Owen.) Cuvier was of opinion that they were hermaphrodites, but that it was possible that their junction only served to excite each other to fecundate themselves. It has been doubted whether these animals are oviparous, ovoviviparous, or viviparous. M. Montègre and Sir Everard Home supposed them to be viviparous. M. Leon Dufour (1825 and 1828) asserts that they are oviparous, in which opinion he is joined by M. Dugès (1828), who believes that the living vermicular animals which M. Montègre took for young *Lumbrici* were intestinal worms only. M. Morren, in the work above alluded to (1829), states that the mode of reproduction is both oviparous and ovoviviparous: that is, we apprehend, the animal under certain unfavourable circumstances will, like the viper, deposit the eggs, instead of hatching them internally. The statement of M. Montègre is that the eggs descend between the intestine and the external envelope to the circumference of the rectum (jusq' autour du rectum), where they are hatched, according to Cuvier, the young making their exits from the anus. M. Dufour, on the contrary, says that they produce eggs analogous to those of the leeches. In the Museum of the College of Surgeons (*Gallery, Phys. Series*, No. 2294), the anterior moiety of an Earth-worm (*Lumbricus terrestris*, Linn.) is shown with the parietes of the body slit open along the back, and the two halves divaricated, so as to expose the alimentary canal, testes, and ovaries. Four portions of black bristle indicate the four testes, which are the small white globular bodies immediately exterior to the bristles, two on each side. The ovaria are the larger oval bodies, of a less pure white than the testes, in the interspace between the bristles. They are four on each side, and increase in size as they are situated more posteriorly. Each of these essential organs of reproduction has a separate external aperture, which is very minute; and impregnation takes place by the apposition of the genital outlets of one individual to those of another, without intromission, as in the leech. In this state two Earth-worms are preserved in a succeeding series (Owen., *Cat.*, vol. iv.); Nos. 2295 and 2296 are also preparations illustrative of the organs of generation in these animals.

Organs of Progression.—Earth-worms creep at a good pace by means of muscular contraction and dilatation acting on the rings, which carry on their under-side the bristle-like processes above mentioned: these last operate as feet. The power of elongation is considerable, and the anterior part of the animal acts as a sort of awl in penetrating the earth.

Habits, &c.—The Earth-worm, as far as relates to its appearance above the surface of the ground, may be considered almost a nocturnal animal. In the night-season and at early morning hundreds may be seen, though not one, unless they are disturbed either by moving the ground or pouring liquids into their holes, is to be found moving about in the day. The power of reproducing parts after mutilation is, as most must have noticed, very great in this animal.

Utility to Man.—The worm-casts, which so much annoy the gardener by deforming his smooth-shaven lawns, are of no small importance to the agriculturist; and this despised creature is not only of great service in loosening the earth and rendering it permeable by air and water, but is also a most active and powerful agent in adding to the depth of the soil, and in covering comparatively barren tracts with a superficial layer of wholesome mould. In a paper 'On the Formation of Mould,' read before the Geological Society of London, by Charles Darwin, Esq., F.G.S., the author commenced by remarking on two of the most striking characters by which the superficial layer of earth, or, as it is commonly called, vegetable mould, is distinguished. These are, its nearly homogeneous nature, although overlying different kinds of subsoil, and the uniform fineness of its particles. The latter fact may be well observed in any gravelly country, where, although in a ploughed field, a large proportion of the soil consists of small stones, yet in old pasture-land not a single pebble will be found within some inches of the surface. The author's attention was called to this subject by Mr. Wedgwood, of Maer Hall, in Staffordshire, who showed him several fields, some of which, a few years before, had been covered with lime, and others with burnt marl and cinders. These substances, in every case, are now buried to the depth of some inches beneath the turf. Three fields were examined with care: the first consisted of good pasture-land, which had been limed, without having been ploughed, about twelve years and a half before; the turf was about half an inch thick; and two inches and a half beneath it was a layer or row of small aggregated lumps of the lime, forming, at an equal depth, a well-marked white line. The soil beneath this was of a gravelly nature, and differed very considerably from the mould nearer the surface. About three years since cinders were likewise spread on this field: these are now buried at the depth of one inch, forming a line of black spots parallel to and above the white layer of lime. Some other cinders, which had been scattered in another part of the same field, were either still lying on the surface or entangled in the roots of the grass. The second field examined was remarkable only from the cinders being now buried in a layer, nearly an inch thick, three inches beneath the surface. This layer was in parts so continuous, that the superficial mould was only attached to the subsoil of red clay by the longer roots of the grass.

The history of the third field is more complete. Previously to fifteen years since it was waste land; but at that time it was drained, harrowed, ploughed, and well covered with burnt marl and cinders. It has not since been disturbed, and now supports a tolerably good pasture. The section here was turf half an inch, mould two inches and a half, a layer one and a half inch thick, composed of fragments of burnt marl (conspicuous from their bright red colour, and some of considerable size, namely, one inch by half an inch broad, and a quarter thick), of cinders, and a few quartz pebbles mingled with earth; lastly, about four inches and a half beneath the surface was the original black peaty soil. Thus beneath a layer (nearly four inches thick) of fine particles of earth, mixed with some vegetable matter, those substances now occurred, which, fifteen years before, had been spread on the surface. Mr. Darwin stated that the appearance in all cases was as if the fragments had, as the farmers believe, worked themselves down. It does not however appear at all possible that either the powdered lime or the fragments of burnt marl and the pebbles could sink through compact earth to some inches beneath the surface, and still remain in a continuous layer; nor is it probable that the decay of the grass, although adding to the surface some of the constituent parts of the mould, should separate in so short a time the fine from the coarse earth, and accumulate the former on those objects which so lately were strewed on the surface. Mr. Darwin also remarked that near towns, in fields which did not appear to have been ploughed, he had often been surprised by finding pieces of pottery and bones some inches below the turf. On the mountains of Chile he had been perplexed by noticing elevated marine shells, covered by earth, in situations where rain could not have washed it on them.

The explanation of these circumstances, which occurred to Mr. Wedgwood, although it may at first appear trivial, the author does not doubt is the correct one, namely, that the whole is due to the digestive process by which the common Earth-worm is supported. On carefully examining between the blades of grass in the fields above described, the author found that there was scarcely a space of two inches square without a little heap of the cylindrical castings of worms. It is well known that worms swallow earthy matter, and that, having separated the serviceable portion, they eject at the mouth of their burrows the remainder in little intestine-shaped heaps. The worm is unable to swallow coarse particles; and as it would naturally avoid pure lime, the fine earth lying beneath either the cinders and burnt marl, or the powdered lime, would, by a slow process, be removed and thrown up to the surface. This supposition is not imaginary, for in the field in which cinders had been spread out only half a year before, Mr. Darwin actually saw the castings of the worms heaped on the smaller fragments. Nor is the agency so trivial as it at first might be thought, the great number of Earth-worms (as every one must be aware who has ever dug in a grass-field) making up for the insignificant quantity of work which each performs.

On the above hypothesis, the great advantage of old pasture-land, which farmers are always particularly averse from breaking up, is explained; for the worms must require a considerable length of time to prepare a thick stratum of mould, by thoroughly mingling the original constituent parts of the soil, as well as the manures added by man. In the peaty field, in fifteen years, about three inches and a half had been well digested. It is probable however that the process is continued, though at a slow rate, to a much greater depth; for as often as a worm is compelled by dry weather or any other cause to descend deep, it must bring to the surface, when it empties the contents of its body, a few particles of earth. The author concluded by remarking, that it is probable that every particle of earth in old pasture-land has passed through the intestines of worms, and hence that in some senses the term 'animal mould' would be more appropriate than 'vegetable mould.' The agriculturist, in ploughing the ground, follows a method strictly natural; and he only imitates in a rude manner, without being able either to bury the pebbles or to sift the fine from the coarse soil, the work which nature is daily performing by the agency of the Earth-worm.

Since this paper was read Mr. Darwin has received from Staffordshire the two following statements:—1. In the spring of 1835 a boggy field was so thickly covered with sand that the surface appeared of a red colour, but the sand is now overlaid by three-quarters of an inch of soil. 2. About eighty years ago a field was manured with marl, and it has been since ploughed, but it is not known at what exact period. An imperfect layer of the marl now exists at a depth, very carefully measured from the surface, of twelve inches in some places and fourteen in others, the difference corresponding to the top and hollows of the ridges or butts. It is certain that the marl was buried before the field was ploughed, because the fragments are not scattered through the soil, but constitute a layer which is horizontal, and therefore not parallel to the undulations of the ploughed surface. No plough, moreover, could reach the marl in its present position, as the furrows in this neighbourhood are never more than eight inches in depth. In the above paper it is shown that three inches and a half of mould had been accumulated in fifteen years; and in this case, within eighty years (that is, on the supposition, rendered probable from the agricultural state of this part of the country, that the field had never before been marled) the Earth-worms have covered the marl with a bed of earth averaging thirteen inches in thickness. (*Proceedings of the Geological Society of London*, vol. ii., 1837-38.)

LUMME, a name for the bird called the *Speckled Diver*, or *Speckled Loon* (*Colymbus Arcticus*, Linn.).

LUNACY. Unsoundness of mind is perhaps the most accurate definition of the present legal meaning of this term that can be given. Formerly a distinction was made between lunatics and idiots: a lunatic being described as one who has had understanding, but from some cause has lost the use of his reason; and an idiot, as one who has had no understanding from his nativity. The distinction between these two classes of persons of unsound mind also produced some important differences in the management of their property. These have now fallen into disuse, and therefore it will be sufficient for the purposes of this article to consider the consequences to the individual of unsoundness of mind generally. Strictly speaking, perhaps a lunatic is one who has lucid intervals, but this distinction may also at the present day be disregarded.

Persons of unsound mind may inherit or succeed to land or personal property either by representation, devise, or bequest, but they cannot be executors or administrators, or make a will, or bind themselves by contract. It is stated by Blackstone that the conveyances and purchases of persons of unsound mind are voidable, but not actually void; this however perhaps needs some qualification, for a bargain and sale, or surrender, &c., and also personal contracts made or entered into by such persons, are actually void as against their heirs or other representatives, though it is true a feoffment with livery of seisin was voidable only. [CONVEYANCES.] A person of unsound mind, though he afterwards be restored to reason, is not permitted to allege his own insanity in order to avoid his own act; for no man is allowed to stultify himself, or plead his own disability (13 Vesey, 590), unless he has been imposed upon in consequence of his mental incapacity (2 Carr. & P. 178; 3 Carr. & P. 1, 30); and an action will lie against a lunatic upon his contract for necessaries suitable to his station. The reader is referred for information upon this subject to 1 Blackst. *Comm.*, 291; 1 Fonbl. *Eq.*, b. 1, c. 2; 2 Sugd. *Pow.*, 295-6; 5 Barn. & C. 170; Moody & M. 105, 6. Acts done during a lucid interval are valid, but the burthen of proving that at the time when the act was done the party was sane and conscious of his proceedings, lies upon the person asserting this fact. The marriage of a person of unsound mind, except it be solemnized during a lucid interval, is void.

The degree of responsibility under which persons of unsound mind are placed with respect to crimes committed by them, as well as the degree of unsoundness of mind which should be considered as depriving the party of that amount of self-control which constitutes him a responsible agent, are in a painful state of uncertainty. As a general rule it may however be laid down that where unsoundness of mind, of such a nature as to render the party incompetent to exercise any self-control, is established, criminal punishment will not be inflicted; but that he will be kept in safe custody during the pleasure of the crown (39 & 40 Geo. III., c. 94, and 1 & 2 Vict., c. 14). On the subject of criminal responsibility, and what constitutes unsoundness of mind in a legal point of view, the reader is referred to the various treatises on medical jurisprudence, particularly to that by Dr. Ray, lately published at Boston in the United States: and also generally to Dr. Haslam's 'Observations on Madness and Melancholy,' 'Medical Jurisprudence as it relates to Insanity,' 'Illustrations of Madness,' and his other works. The following remarks may however be useful.

In lunacy the question to be decided is not whether the individual be actually of sound mind, though a jury on an inquisition held under a commission of lunacy must express their opinion or finding in the form that the alleged lunatic is of 'unsound mind' (*In re Holmes*, 1 Russell, 182); but though such must be the finding in order to make a man legally a Lunatic, the real question is whether or not the departure from the state of sanity be of such a nature as to justify the confinement of the individual, or the imposition of restraint upon him as regards the disposal of his property. No general rule can be laid down by which to ensure a right decision: but in all such inquiries it should be kept in mind that insanity varies infinitely in its forms and degrees. It should be particularly remembered that persons may be of weak mind, and eccentric, and even be the subjects of delusions on certain subjects, and yet both inoffensive and capable of directing pecuniary matters. The individual's natural character should be taken into consideration as accounting for eccentricities of manner and temper, and his education in estimating his ignorance and apparent want of intellect; and lastly due allowance must be made for the irritation and excitement produced in a mind, perhaps naturally weak, by the inquiry itself, and the attempt to deprive him of his liberty and property. Confidence should not be placed in depositions or evidence founded on short and inattentive examinations.

Sometimes the madman conceals his disease, and with such remarkable cunning and dissimulation that the detection of it is very difficult: this is more particularly the case when the insanity consists in some hallucination; and here, unless the nature of the delusion be known, it will often be in vain to attempt to elucidate by questions any proof of unsoundness of mind. Those who are insane on particular subjects will reason correctly on ordinary and trivial points, provided these do not become associated with the prevailing notions which constitute their disease.

When insanity is urged as the ground of non-responsibility for a criminal act, it has been erroneously held that the main point to be ascertained is, whether the individual has or had 'a sense of good and evil,' 'of right and wrong.' But this, though the doctrine of the English law, is found incapable of practical application; and the records of trials of this kind show that the guide to the decision has generally been the proof, or absence of proof, that insanity of some kind existed at the time of the act, although before and after it the power of reasoning and the knowledge of right and wrong might be retained. Thus, on the trial of Hatfield for shooting at George III., Erskine argued that the existence of a delusion in the mind absolves from criminal responsibility, if it be shown that the delusion and criminal act were connected; and on this principle Hatfield was acquitted, but confined for life. Bellingham however, who shot Mr. Percival under an equally powerful delusion, in consequence of the greater excitement in the public mind occasioned by the result of the insane act, was convicted and executed. In many instances homicide has been prompted, not by any insane hallucination or delusion, but by a morbid impulse to kill. Here there is generally evidence of the feelings and propensities of the individual having been previously disordered, of his being in fact the subject of moral insanity [INSANITY], and judgment in such cases is aided by the absence of motive to the act. Where the general conduct of the prisoner has been such as to indicate unsoundness of mind, even though considerable contrivance has accompanied the act, or where there is evidence of his having been the subject of an irresistible impulse to kill, it is becoming now the practice to find a verdict of acquittal, in opposition to the older authorities, who confined the exemption from responsibility on the ground of insanity within very narrow limits.

A lunatic is, according to law, responsible for acts committed during 'lucid intervals,' a term by which is understood however, not mere remissions of the violence of the disease, but periods during which the mind resumes its perfectly sane condition. In forming an opinion concerning such lucid intervals, it is to be remembered that the absence of the signs of insanity must have considerable duration before it can be thence concluded that the mind is perfectly sane; and that lunatics, when apparently convalescent, are subject to sudden and violent paroxysms.

One of the most difficult points to be determined is with regard to the mental capacity of old persons, in whom the mind is confessedly impaired. The decay of intellect in old age is first manifested in the loss of memory of persons, things, and dates, and particularly with respect to recent impressions. But it is not the mere liability to forget names, &c., which will render the will of an old person invalid; it should be shown that in conversation about his affairs, and his friends and relations, he did not evince sufficient knowledge of both to dispose of the former with sound and untrammelled judgment. Many old men appear stupid and forgetful, but when their attention is fairly fixed on their property, business, and family affairs, understand them perfectly, and display sagacity in their remarks.

The care and custody of idiots and lunatics form a branch of the royal prerogative, and were formerly administered by the king himself. Since the dissolution of the Court of Wards, the lord chancellor has been specially appointed to exercise this power. [CHANCELLOR.] The method of proving a person to be of unsound mind, for the purpose of depriving him of the control of his property, and, where the circumstances require it, providing for the safe custody of his person, is as follows. The lord chancellor upon petition supported by affidavits, and in some cases upon a personal interview also with the alleged lunatic, when such a course seems necessary, grants a commission to inquire into the state of mind of the party, and if the jury should find him to be *lunatic* or of *unsound mind* (one of which modes of finding is absolutely necessary), the care of his person is committed to some relation or other fit person with a suitable allowance for maintenance, who is called the committee of the person; and the care of the estate is committed either to the same or some other person, who is called the committee of the estate. [GUARDIAN.] The commission is a proceeding issuing from the common-law side of the Court of Chancery; but after the appointment of the committee, the chancellor acts by virtue of his general authority, and his orders are enforced by the general process of the court. The committee of the estate is considered as a mere bailiff appointed by the crown for the sole interest of the owner, and without any regard to his successors; but the court will order allowances to be made to near relations of the party who is of unsound mind, and even to his natural child, where the circumstances of the several parties justify and require it, and will direct proper acts to be done in the management of the estate, as repair of buildings, felling of timber which is deteriorating, &c.

On the general subject see Stock *On the Law of Non Compotes Mentis*; and Collinson *On Lunacy*.

LUNAR OBSERVATION generally means an observation of the moon's distance from a star, for the purpose of finding the longitude. [LONGITUDE AND LATITUDE, METHODS OF FINDING.]

LUNAR THEORY. By the theory of a planet is meant the deduction of its motion from the law of gravitation. This subject is discussed in the article GRAVITATION. For the numerical data see MOON.

LUNATIC. [LUNACY.]

LUNATIC ASYLUMS. Besides the large endowed hospitals (as the Bethlehem) and county asylums, there are numerous private establishments for the reception of the insane. In the cities of London and Westminster, and seven miles around, and in the county of Middlesex, these asylums are under the direct jurisdiction of the Metropolitan Commissioners of Lunacy, who are appointed annually by the lord chancellor for the purpose of licensing and visiting such houses. The commissioners are in number not less than 15 and not more than 20: four or five must be physicians, and two barristers. In other parts of England similar powers of granting licences and appointing visitors are delegated to the justices in general or quarter-sessions; but notices of all such licences are forwarded to the office of the metropolitan commissioners.

No person can be admitted into a house kept for the reception of the insane without a certificate signed by two medical men, not interested in the profits of the establishment, who must have separately visited and examined the patient within seven days before his admission into the asylum; or, upon satisfactory reasons being shown, the certificate may have the signature of one medical man only, but then it must be signed by a second within seven days after the patient's admission.

A variety of statutes have been passed for the management and regulation of houses for the reception of persons of unsound mind, and of county lunatic asylums for the maintenance of pauper and criminal lunatics, the last of which is 3 & 4 Will. IV., c. 64, continued by 1 & 2 Vict., c. 73.

(For the treatment of lunatics see Insanity.)

LUNATION, the time between two new moons. [Moon.]

LUND is a town in Sweden, in the province of Scane and Län of Malmohus, in 55° 40′ N. lat. and 13° 10′ E. long., about seven miles from the Sound. It is situated in the centre of an extensive plain of great fertility, which produces richer crops of wheat than any other district of Sweden: tobacco and madder are also raised in it. The streets are straight and wide, and the houses commonly of two floors, and many of them surrounded by orchards and gardens. In the centre of the town is the cathedral, a large and magnificent building of hewn stone. Lund is the seat of a bishop, and has a celebrated university. Between the cathedral and the university buildings is a space planted with lime-trees, and kept in good order. The university buildings, erected in 1668, consist at present of two extensive edifices, the old and new one. The former, which is the larger, is three stories high, and has a tower. In the ground-floor is the historical museum; there are also two lecture-rooms. In the second floor is the library, which consists of nearly 40,000 volumes, among which are a few valuable manuscripts. In the third floor is the lecture-room for mathematics, and the collection of instruments. The observatory is in the tower. The new university building contains the meeting-rooms of the senate and of the four faculties, and likewise the archives; in the second floor are the collections of natural history. The chemical laboratory is in a separate building. There is a botanical garden belonging to the university. In the building attached to it is the lecture-room for botany, and in the upper floor the lecture-room for anatomy, with numerous preparations. Near the botanical garden is a plantation called Paradislycka, in which foreign forest-trees are grown for sale, and transplanted to other parts of the kingdom. The number of students amounted in 1830 to 632; the population of the town, according to the census of 1825, is nearly 4000, and it is supposed that it now exceeds 4500 souls. An active commerce in the produce of the adjacent country is carried on between Lund and Malmö. (Forsell's *Statistics of Sweden;* Schubert, *Reise durch Schweden, Norwegen,* &c.)

LUNDIN, SIR ALAN, of Lundin, or Lundie, in the shire of Forfar, was son and heir of Thomas de Lundin, who held the office of king's hostiarius, or door-ward, and was one of the magnates Scotiæ who ratified the marriage of king Alexander II. with Joanna of England. Sir Alan early married the bastard daughter of this king Alexander, and before the year 1233 he had succeeded his father in the office of Durward. Before this time also he had imitated his father's munificence to the church, and in the spirit of the age had founded a Dominican convent at Montrose. He was a forward impetuous character, and for twelve years assumed without any authority the title of earl of Athol.

In 1243 he was appointed lord-justiciar of Scotland, and so continued for about six years, when he was removed under circumstances which strongly mark his audacity and ambition. In 1249 he endeavoured to obstruct the coronation of the infant son of king Alexander II.; and the next year he prevailed on Robert, abbot of Dumfermline, then chancellor of the kingdom, to make a motion in council to legitimate his wife, so that on failure of issue of the king's body she and her heirs might succeed to the throne. For this act the king conceived so great a displeasure that he immediately turned the chancellor out of office, and soon after the justiciar likewise. The latter joined King Henry III. in France, and served in his army; and at length, in 1255, by the influence of the English king, he was re-instated in his office of lord-justiciar, and so continued till 1257, when he was again removed for the powerful Comyn. He died in 1275, leaving three daughters, who carried his great possessions with his blood into other families. Fordun calls him 'vir dapsilis et strenuissimus in armis, et regi et regno fidelissimus.'

LUNDY ISLAND. [Devonshire.]

LUNE, LUNULE, the figure formed on a sphere or on a plane by two arcs of circles which enclose a space. [Hypothenuse; Sphere.]

LUNE (River). [Lancashire.]

LÜNEBURG is an antient allodium of the house of Brunswick, which, in the year 1235, was raised, together with Brunswick, to the rank of a duchy, and was subsequently separated, and formed a distinct principality. In recent times it lost the bailliwick of Klötze, which was ceded to Prussia, but was indemnified by the addition of that part of Lauenburg which was retained by Hanover. It is now a landdrostei, or province, of the kingdom of Hanover, situated between 52° 15′ and 53° 30′ N. lat. and 9° 16′ and 11° 40′ E. long. It is bounded on the north by the Elbe, which separates it from Holstein, Hamburg, and Lauenburg; on the north-east by Mecklenburg-Schwerin and the Prussian province of Brandenburg; on the east by the province of Saxony; on the south-east and south by Brunswick and Hildesheim; and on the west by Calenberg. The shape is near a square, and the area 4080 square miles. The population, according to the latest census, is 306,146. The country is on the whole an immense sandy plain, which is broken by some chains of low hills. This tract is chiefly covered with heath, with here and there extensive turf moors, and considerable woods, mostly of fir. Fertile arable land is rare, but on the banks of most of the rivers, especially the Elbe and the Aller, there is very rich marsh-land. It was calculated twenty years ago that at least seven-tenths of the whole province were covered with heath and brake; for of 4,172,642 Calenberg acres which Lüneburg contains, only 560,467 acres were arable land, 174,522 acres pasture, and 492,000 acres forests. On the banks of the smaller rivers the land is in many parts well cultivated; for instance, about Lüchow and Uelzer, where flax of good quality is grown. The principal river is the Elbe, which runs along the frontier; only the bailliwick of Neuhaus lies beyond that river, which receives from the province itself the Ilmenau, with its affluents the Wipperau, Lühe, Seve, and Netze; and the Aland and Ieeze, which come from the Altmark. The Ohre and the Este rise in Lüneburg, the former running into the province of Brandenburg, and the latter towards Bremen. The Aller, in the south of the province, with its tributaries the Oker, Fuse, Oerze, and Böhme, belongs to the valley of the Weser. The country has a very gradual fall towards the Elbe and the Weser, especially towards the former, against the inundation of which the land is secured by dikes. The highest land between the two rivers is the celebrated Lüneburg Heath. This tract, which has been called the desert Arabia of Germany, has some villages and seats of rich landowners on the small streams, who enjoy very extensive rights of common on this heath. The breed of small coarse-woolled sheep, called Heideschnucken, which a French traveller mistakes as the name of a peculiar race of people, *le peuple des Heideschnucks,* is kept on this heath. The villagers derive their chief subsistence from the breeding of bees and gathering bilberries, juniper-berries, and cranberries, of which vast quantities are sent to Hamburg and Bremen. The heath is so favourable to the breeding of bees, that many thousand beehives are sent thither from other parts of the kingdom. The cultivation of the soil has made of late years considerable progress. As it is only in the rich marsh-lands that good crops of corn can be raised, there is scarcely sufficient for the population. Flax is pretty extensively cultivated. The land produces also hops, potatoes, garden vegetables, and turnips in abundance, but only a little fruit. The breeding of cattle is more profitable than tillage; the sheep are very numerous, but their wool is in general indifferent. The breed of horses has been very much improved by the national stud at Celle. The forests afford timber for building as well as fuel, for which there is a good sale. Gypsum abounds in many places; and in the vicinity of the gypsum are the celebrated saline springs. Near Lüchow there is a district called Drawän, or Wendland, the inhabitants of which, in their language and manners, retain traces of their descent from the Wends. The main road for commerce between Hamburg and the interior of Germany passes through this principality. The staple town is Lüneburg, and the inhabitants expect to derive great advantages from the privilege just granted to the city by his present majesty, to hold three annual fairs. The traffic from Hamburg by way of Harburg and Celle, from Bremen by way of Celle, and from Lübeck by way of Lüneburg, is not so considerable. There are no manufactures, properly so called, except at Lüneburg, Harburg, and Celle. Spinning of yarn, linen-weaving, and stocking-knitting are pretty general among the country-people, who likewise make a quantity of wooden wares. In general the inhabitants are in pretty easy circumstances.

LÜNEBURG, the capital, lying in 53° 15′ N. lat. and 10° 17′ E. long., is situated on the Ilmenau, which is here navigable about fifteen miles above its junction with the Elbe, and has 13,000 inhabitants. At the western end is the Kalkberg, the highest mountain in the country (about 350 feet high), on which the convent of St. Michael and some fortifications were erected in the tenth century. At present 20,000 tons of lime are annually procured from the Kalkberg, and exported to Hamburg and Holland. Lüneburg was formerly surrounded with walls, but the fortifications are now dismantled. The principal buildings and public institutions are the royal palace, the gymnasium, St. Michael's church, in the vaults of which are the monuments of the antient princes, the convent of St. Michael, with a Latin school, the town-hall, the arsenal, an hospital, &c. The inhabitants carry on a considerable trade in the products of the country, such as linen, salt, wax, honey, woollens, linen thread, flax, horses, of which 70,000 are annually brought hither to market, &c. There are very productive salt-works in a part of the city which is separated from the rest by a wall, and is called the Sulze. The spring from which the salt is obtained is very strong, being perfectly saturated, and yields 200,000 cwt. annually, and would yield much more. We have already spoken of the transit trade from Hamburg to the interior. There are manufactories of soap, snuff, playing-cards, some breweries and distilleries, a paper-mill, &c. Of the other towns in the principality the most important are Celle (otherwise Zell), a tolerably well-built town, at the junction of the Fuse and the Aller, the seat of the supreme court of appeal; it has a gymnasium, a national stud, with 120 stallions, a large house of correction, six churches, and many other public buildings and institutions. The suburbs are very extensive. On the west side of the town is a palace, with a magnificent chapel, and in the French garden is the monument of Matilda, queen of Denmark, sister of George III. of England. Harburg, on the Elbe, opposite Hamburg, has some manufactories of linen, woollens, and stockings, a powder-mill, tanneries, wax-bleaching, sugar-refinery, and a great trade in timber. Uelzen in the Heath, on the Ilmenau, has 3000 inhabitants, who cultivate the best flax, and have manufactories of woollen cloth, camlets, and starch.

LUNEL. [He′rault.]

LUNETTE, in fortification, is a work similar to a ravelin, or demi-lune, but generally of smaller dimensions. Such works have been placed in the retired angles between the ditches of a bastion and of the collateral ravelin, but they are now usually considered as advanced works, and are placed in front of those just mentioned.

The form of a lunette is the same as that of the redoubt Y in the plan at the end of the article Fortification; and its positions may be understood by conceiving such works to be placed beyond the glacis S S on lines passing through P and Z, X and R, and produced. Each lunette is protected in front by a ditch, beyond which is a covered-way, as usual.

The best disposition for a series of such works is that in which they are alternately more and less advanced beyond the fortress; since then they afford one another a reciprocal defence by the crossing fires which may be kept up from the nearest faces of every salient and retired lunette. And should the besiegers succeed in carrying their approaches up the glacis of the latter, the artillery on the flanks of the two more salient and collateral lunettes would effectually prevent them from forming a battery on its crest to breach the work. The operations against any one retired lunette must consequently be postponed till the two collateral lunettes are taken; whereas had all been equally advanced beyond the fortress, the three might have been breached and assaulted at the same time.

To give the more advanced lunettes, which are generally those placed beyond the ravelins, all the advantages of which they are susceptible, the magistral lines of their faces should coincide with the sides of an equilateral triangle whose base is a line joining the faces of the two collateral bastions at points about twenty or thirty yards from their flanked angles; for thus the earthen parapets at the salient angles of the lunette will not be easily destroyed by rain, and the ditches before the faces of the work can be defended by two or more pieces of artillery conveniently placed on the faces of the bastions. The ditches of the retired lunettes should in like manner be defended by artillery placed on the faces of the collateral ravelins; and the magistral lines of their faces should consequently be directed towards such ravelins.

In a front of fortification of the ordinary extent (350 yards) this rule for placing the advanced lunette will permit the ditch and covered-way of the latter to be defended by a fire of musketry from the retired places of arms L L [Fortification], and from the covered-way before the bastions; and, that such fire may graze the bottom of the ditch of the lunette, this ditch ought to be in an inclined plane nearly coinciding with the slope of the glacis S S. Should the ditch so formed be too shallow to fulfil its end, which is that of being an obstacle to the enemy in his attempt to assault the lunette, it would be necessary to make it deeper; and that it might not thus become a trench in which the enemy would be covered from the fire of the defenders, it should communicate with water, by which it might be filled previously to the expected assault.

The rampart of a lunette differs in no respect from that of other works; it should have the same relief, or height above the natural ground, as is given to the ravelins; since, as in the latter work, the fire of artillery should be capable of being directed against the trenches of the enemy at the foot of the glacis, over the heads of the defenders on the banquette of the covered-way. Its escarp should be revêted with brick or stone, in order that the enemy may be compelled to form a breach in it by artillery, or by a mine, previously to making an assault; or at least that the attack by escalade might be a process of difficulty and danger. The terreplein, or ground in the interior, should be high enough at the gorge to prevent an enemy from entering there without scaling-ladders; this part should be further protected by a loop-holed wall, or a line of palisades; it should be seen and defended from some collateral work, and an open caponnière, or a subterranean gallery, for communication, should lead from the gorge of each lunette to the place of arms in its rear. The advanced covered-way should pass in front of all the lunettes, and it might terminate at the two extremities on inaccessible ground, or in the general covered-way of the place.

Advanced lunettes about a fortress form strong posts for artillery, by which an enemy is compelled to commence his approaches at a greater distance than would otherwise be necessary. The length of their faces may be from sixty to seventy yards, and that of their flanks from fifteen to twenty. It is considered that a well-disposed series of these works would prolong the defence of a place about ten or twelve days. But they are only proper for fortresses of the first magnitude, since they would require a large garrison; and the troops, on being compelled to retire, might not find sufficient room in a small place.

LUNE′VILLE, a town in France, capital of an arrondissement in the department of Meurthe, 186 miles from Paris in a direct line east by south, or 221 miles by the road through Châlons sur Marne, Bar le Duc, and Nanci. This place appears to have been a mere village before the eleventh century. It afterwards became a fortified town and the capital of a county. In the war between Charles le Téméraire, duke of Bourgogne, and René II., duke of Lorraine, it was taken and re-taken. In the year 1638 it was taken by the French, who demolished the fortifications. Leopold, duke of Lorraine, rebuilt the castle at the commencement of the last century, and made it his residence.

A fire destroyed part of this castle, A.D. 1720, but it was promptly restored. A second fire (A.D. 1755) destroyed one of the wings, which has been rebuilt of late years. This castle was the usual residence of Stanislaus, ex-king of Poland and duke of Lorraine; it now serves as a cavalry barrack, and is capable of accommodating 6000 horse. The park and gardens have become public walks, and in the 'Champ de Mars,' or exercise-ground, a cavalry exercise camp is formed every year. There is a covered riding-school for cavalry, 320 feet long by 85 wide, without pillars to support the roof, in which 200 men can exercise at one time. The town was much improved by the dukes Leopold and Stanislaus. The streets are for the most part wide and straight. There are three suburbs, those of Nanci, of Viller, and of Alsace. There are two bridges over the Vezouze, on which the town stands; and near the town are two others over the Meurthe, into which the Vezouze falls just below Lunéville. The parish church is a modern building of elegant architecture; the portal however is overcharged with figures and ornaments; two towers rise above the portal, crowned with statues, the one of St. Peter, the other of Michael the archangel casting down Satan. The Place Neuve (New Square) is ornamented with handsome buildings. The population of Lunéville in 1831 was 12,216 for the town, or 12,341 for the whole commune; in 1836 it was 12,798 for the commune. The inhabitants are engaged in spinning cotton and woollen yarn, weaving woollen-cloth and cotton goods; manufacturing silk, cotton, and worsted hose; in making embroidery, pins, hats, earthenware, iron-stoves, and especially leather and gloves. There are several breweries. The principal trade is in the above articles; also in grain, wine, brandy, flax, hemp, wood, and fruit grown in the gardens round the town. There are six yearly fairs. There are several government offices, a high-school, an agricultural society, two hospitals or asylums (one of them for orphans), a Jews' synogogue, and a theatre. Charles Alexander of Lorraine, an Austrian general of reputation in the middle of the last century, was born here. A treaty of peace between the empire and France was negotiated at Lunéville in 1801.

The arrondissement of Lunéville has an area of 466 square miles, and comprehends five cantons, and 145 communes. The population in 1831 was 82,851; in 1836 it was 84,698.

LUNGS. [RESPIRATION.]

LUNGS, DISEASES OF THE. The highly organized structure of the lungs and the incessant exercise of their important function, frequently under noxious circumstances, render these organs perhaps the most liable to disease of any in the body. Exposure to damp and cold, sudden atmospherical changes and transitions of temperature, want of proper nourishment, inattention to personal cleanliness, and some of the mechanical employments in which the confined and heated atmosphere of workshops is impregnated with minute particles of foreign substances, such as steel, wool, &c., may be considered as amongst the chief exciting causes of this extensively prevailing class of diseases. The subject may be conveniently divided into those affections which are acute and rapid in their progress, and those in which their course is slower and the changes of structure more gradually effected.

In *inflammation of the lungs* (pneumonia, peripneumonia) the air-cells and parenchymatous structure of the organ are the seat of the disease. This affection is generally preceded in a greater or less degree by shivering and such other febrile symptoms as commonly usher in any febrile attack. Soon afterwards pain and a sense of oppression are felt in the chest, with hurried respiration and a short dry cough. The pain is sometimes severe, sometimes it is described as of a dull and obscure kind and deeply seated. If the pleura, or investing membrane of the lungs, participate in the affection it is generally severe. At first there is little expectoration, but this increases in the progress of the disease, and the sputa acquire a reddish or rusty colour from the admixture of small quantities of blood. They also possess an unusual viscidity and tenacity, sometimes to such a degree that the vessel into which they are received may be inverted without their falling out; they also contain numerous minute bubbles of air, which are prevented from escaping by the consistence of the secretion.

If the disease continue unchecked, the difficulty of breathing becomes much greater, and the respirations, which in the natural state are about 20 in a minute, increase in frequency to about 40 or 60. Sometimes there is little cough throughout the disease, but most commonly it increases as the disease advances, and the sputa become more deeply tinged with blood. The features subsequently assume a livid appearance; the breathing gets more oppressed; expectoration is effected with difficulty; the powers of life fail, and the patient dies from the lungs being no longer able to carry on their function.

When a favourable change takes place in the course of the disease, either spontaneously, or from judicious medical treatment, it is generally attended by perspiration, the expectoration loses its rusty colour and unusual tenacity, the urine becomes turbid, and sometimes there is diarrhœa. Andral and other authors are of opinion that improvement is most likely to take place at certain times—critical days. The diagnosis of this disease has received most important assistance from auscultation, and in many instances it has been detected by its aid, where formerly it would have been overlooked. The assistance afforded by the auscultatory signs will perhaps be better understood if we defer them until we have spoken of the changes of structure in the lungs occasioned by inflammation.

In the early stage of pneumonia the inflamed part acquires an unnatural density and heaviness from the unusual accumulation of blood in it, and if a portion of lung so circumstanced be examined after death, pressure with the finger on its surface leaves an indentation which is not filled up, as would immediately be the case in a healthy state of the part. When it is cut into, a bloody frothy fluid exudes freely from it, and the surfaces present a deep blood-red colour, and if a portion be squeezed between the finger and thumb a crackling noise is heard indicating the presence of air. In a more advanced state, the lung is found still more dense, and does not crepitate when squeezed, showing that air is no longer admitted. As in this condition it somewhat resembles liver, it has been termed the stage of hepatization. When the disease has proceeded still further, suppuration may be found to have taken place. Pus is then observed to be effused throughout the structure of the diseased part, by which its dull red is changed to a yellow or straw colour, and the mass is rendered soft and easily broken. Suppuration in the form of abscess very rarely occurs as a consequence of pneumonia. Laennec is of opinion that death most probably takes place before the change can have proceeded to that extent.

Auscultatory Signs.—In that stage of the disease in which there is only an accumulation of blood in the part, and whilst air is still admitted, the respiratory murmur is heard on examining the chest with the ear or stethoscope, but it is attended with a crackling sound which resembles that produced by rubbing a portion of hair between the finger and thumb near the ear, or by throwing salt into the fire; this is commonly called crepitous rattle, or crepitous respiration. A clear sound is also heard on percussing the chest.

If the disease has proceeded to the stage of hepatization, the lung being in that part solid and impervious to air, percussion will afford only a dull sound without resonance, and the murmur attendant on respiration will be altogether wanting. Should a large branchial tube pass near the hepatized portion, the resonance of the voice in the bronchus will be heard more distinctly than usual, on account of the solid being a better conductor of sound than the healthy lung.

When suppuration has taken place, the sound on percussion is also dull, and the natural respiratory murmur is wanting, but in its stead a loud gurgling noise is heard, resembling that produced by air passing through soap-suds. It is perhaps occasioned by pus escaping into the larger air-tubes.

Treatment.—The treatment of inflammation of the lungs must be conducted on the same general principles as inflammation occurring in any other part. The important nature of the organ renders it necessary to resort promptly to bleeding, sometimes to a very large amount, and on repeated occasions. Antimonials and mercury are also highly useful in this affection.

Inflammation is sometimes confined to the bronchial tubes, and is called bronchitis; it may also co-exist with pneumonia. [BRONCHITIS.]

Mortification or gangrene of the lungs, though sometimes occurring as a result of pneumonia, most frequently takes place as an independent affection. Great fetor of the breath, with an expectoration of dark-brown, greenish, ar fetid sputa, excessive debility, and a cadaverous expression of countenance, are the symptoms by which it is indicated. After death portions of lung are found in a partially decomposed state, of a dark brown or dirty greenish appearance, with a putrid smell. Occasionally, under favourable circumstances, the mortified parts have been separated and removed by expectoration, and the patients restored to health; but this is not a result which can commonly be looked for. It has been known to occur sometimes as a consequence of working in cesspools, and of long exposure to the noxious effluvia attendant upon such occupations.

Hæmoptysis; Spitting of Blood.—Expectoration of blood may occur either by exhalation from the mucous membrane of the air-tubes or from the lesion of a blood-vessel. It generally occurs in early life, from the age of fifteen to thirty-five, and in the former instance may be dependent upon local congestion. This determination of blood to the lungs may be occasioned by the sudden suppression of some natural or accidental discharge from other parts, as in suppressed or impaired menstruation, or the arrest of an hæmorrhoidal discharge. Malformation of the chest also, by interfering with the free circulation through the lungs, or an impeded transmission of blood through the abdominal viscera, from the presence of tumours or ascites, may likewise contribute to produce it. Sometimes it appears to be dependent upon an altered condition of the blood itself, as in purpura and some eruptive fevers; but its most frequent cause is tubercular disease of the lungs, in which it may arise in an early stage from the obstruction to the circulation occasioned by the tubercles, or subsequently from the vessels participating in the ulcerative destruction.

A remarkable sympathy has been observed to exist between the uterus and the organs of respiration, and spitting of blood has sometimes been known to precede the appearance of the menses, and to cease entirely on their accession. Sometimes it has been found to supersede the discharge altogether, or to make up for a deficiency in its quantity.

An attack of hæmoptysis is usually preceded by certain premonitory symptoms, such as chilliness, headache, lassitude, and a quick and vibrating pulse. The patient also experiences a sensation of weight and constriction at the chest, with a feeling of heat and itching in it. The expectoration of blood is attended with cough. Sometimes the quantity brought up is very considerable, and is expelled with violence; at other times the sputa are only streaked with it. The expectorated blood is generally of a vermillion colour, and, when in small quantities, it is frothy and mixed with air. When the blood comes from the stomach, it is brought up by vomiting and without cough, without the frothy appearance, and is of a dark grumous character.

Pulmonary Apoplexy.—When it happens that the blood, instead of being exhaled into the air-tubes, is effused into the parenchymatous structure of the lungs, the name of pulmonary apoplexy is given to it. One or two lobules, or a small portion of the lungs only, may be affected in this manner, the structure of the part not being broken down by it. When this is the case, hæmoptysis may not take place. Such effusions are found after death in the form of circumscribed indurated masses of a dark brown colour nearly approaching to black, and surrounded by the lung in a perfectly healthy state. Life not being immediately destroyed in such cases, time is given for the absorption of the most fluid parts of the blood, which will account for the indurated character of these deposits. When the effusion is more extensive, large portions of the substance of the lung may be torn and broken down, and hæmoptysis to a very considerable and generally immediately fatal extent takes place.

One of the most common causes of pulmonary apoplexy is disease of the heart, by which the circulation through the lungs is impeded and oppressed with blood. The causes mentioned as conducing to hæmoptysis are also common to this affection, and the symptoms are very similar. The plan of treatment in these affections is founded on the same general principles as are applicable in any case of internal hæmorrhage. [HÆMORRHAGE.]

Phthisis Pulmonalis.—This is by far the most frequent and most fatal of all diseases of the chest. It is the consequence of the deposition of small granular bodies of a greyish-white colour, called tubercles, in the structure of the lungs. By coalescing these smaller bodies acquire sometimes the size of a bean, or even of a filbert, assume a light yellow colour, and become something like cheese in consistence. They may exist in a quiet state for a long time without materially affecting the health, but subsequently they become more active, soften, and give rise to abscesses (vomica), which increase and produce death either by suffocation or by wearing out the powers of the constitution. For a more extended account see article PHTHISIS PULMONALIS.

Malignant Diseases.—The lungs are also subject to diseases of a specifically malignant nature, such as medullary sarcoma and melanosis; but these rarely occur as a primary affection. The medullary and melanoid matter is deposited in these organs as a secondary affection, in conjunction with its existence in other parts, and frequently in all or the majority of the organs of the body.

Black or Carbonaceous Matter in the Lungs.—Of late years medical men have observed a peculiar discoloration in the lungs of persons who have died after working for a long period of time in coal-mines, or in mines where gunpowder is used in large quantities for blasting masses of rock. The lung is found of a coal-black colour throughout, though still perfectly natural in all its other characters. It also exists in connection with disease of the lung, and the expectoration of persons so affected partakes of the same colour. The cause of it seems to be doubtful; but most probably it arises from the inhalation and absorption of the carbonaceous matter existing in the atmosphere of such mines.

Bony and cartilaginous tumours have been found in the lungs, and the membrane surrounding the lungs (the pleura) is sometimes met with converted into bone; sometimes it is studded with tubercles similar to those found in the lungs of Phthisis. For an account of inflammation of the pleura see PLEURISY.

LUNULI'TES. [CELLARIÆA, vol. vi., p. 400.]

LUPA. (Crustaceology.) [PORTUNIDÆ.]

LUPINITE, a peculiar bitter substance, extracted from the leaves of the *Lupinus albus* by treating the meal with anhydrous alcohol: the solution being evaporated to dryness, the lupinite remains; it has a green colour, is translucent, and may be melted; it is soluble in æther as well as in alcohol; but it is probably mixed with other vegetable products.

LUPI'NUS, a very extensive genus of hardy annual, perennial, and half-shrubby plants, commonly cultivated in gardens for the sake of their gaily-coloured flowers. The species inhabit Europe, the basin of the Mediterranean, and the temperate parts of both North and South America, especially of the former, where they are extremely abundant; but they are unknown in a wild state throughout all the tropics, except on mountains, and in the principal part of Asia, New Holland, and South Africa. Figures of great numbers have appeared in the volumes of the 'Botanical Register and Magazine,' and there is a monograph of the genus published at Lund by the younger Agardh in 1835, under the name of 'Synopsis generis Lupini.'

Lupines have been used as green manure, that is, as a crop to be ploughed into land when green, but they are not esteemed for this purpose. They are also still cultivated, as in the times of the Romans, by the Neapolitans and other southern nations, who eat the seeds after steeping them in water to diminish their bitterness, which always renders them unpleasant to those who are unaccustomed to them. The Greeks, who called them thermos, employed lupines not only as an article of food, but medicinally, esteeming them vermifugal and emmenagogue, &c. (Dioscor., lib. i., c. 132.) What species was cultivated by them is unknown; their wild thermos is supposed by Sibthorp to be the *L. angustifolius*. The two species most common in Greece now are *L. hirsutus* and *pilosus*, but the species cultivated in the south of Europe are *L. albus* and *L. thermis*.

Lupines are said to derive their name from *lupus*, a wolf, because of their devouring the substance of the land on which they are grown.

LUPO'NIA. [CYPRÆIDÆ, vol. viii., p. 256.]

LUPULIN, a name given to a substance extracted from hops, and which was at first supposed to be their peculiar principle; but it has been since found that it contains only from about 8 to 12 per cent. of the vegetable matter to which hops owe their power, and to this the name of *lupulite* has been given.

LUPULITE is prepared by a tedious process; it is nearly colourless, but sometimes of orange-colour: in the ormer case it is opaque, but in the latter transparent; it as no smell till it is heated, and then it has the odour of ops; its taste is bitter: water, even when boiling, dissolves nly $\frac{1}{25}$th of its weight; the solution is pale yellow, and is ot either acid or alkaline; neither dilute acids, alkalis, nor olutions of metallic salts produce any effect upon it; alcohol issolves lupulite readily, but in æther it is almost insoluble.

LUPUS (the Wolf), one of the old constellations, named Aratus and Ptolemy simply θήριον, 'the wild beast.' It as not a separate constellation, but was carried in the right and of the Centaur towards the Altar. The same description is given by Hyginus. In modern maps it is represented as a wolf transfixed by the spear of the Centaur. It situated between Centaurus and Ara, directly under corpius.

The principal stars are as follows:—

Character. (Not in Bayer.)	No. in Catalogue of		Magnitude.	Character. (Not in Bayer.)	No. in Catalogue of		Magnitude.
	Flamsteed. (Piazzi.) Lacaille(C).	Astron. Society.			Flamsteed. (Piazzi.) Lacaille(C).	Astron. Society.	
(*f*)	2*	1731	4½	β	(211)	1689	3½
(χ)	5	1797	5	η	(217)	1821	5
δ	(31)	1734	5	π	(242)	1704	5
ι	(33)	1622	4½	θ	(248)	1835	4
(ϕ^1)	(34)	1738	5	λ	(266)	1713	5
ε	(35)	1739	4½	σ	1216 C	1642	5
(ϕ^2)	(42)	1742	5	ρ	1223 C	1648	5
τ^1	(66)	1634	5	α	1231 C	1657	3
τ^2	(67)	1635	5	ζ	1265 C	1717	4
γ	(98)	1760	4	κ	1266 C	1718	5
ι	(113)	1766	5	μ	1274 C	1728	5
(*g*)	(134)	1779	5	ν	1281 C	1735	5
o	(185)	1679	5				

LURE. [Saône, Haute.]

LU'RIDÆ, a name given by Linnæus to one of his atural orders of plants. It is equivalent to Solana of odern botanists.

LUSA'TIA. [Lausitz.]

LUSIGNAN. [Cyprus.]

LUSITA'NIA. [Portugal.]

LUSTRUM was the name applied to a period of five lar years among the Romans; and the termination of is period was generally marked by great religious solemnities. A purifying sacrifice, called *suovetaurilia*, was ually offered at this time by one of the censors in the ampus Martius (Liv., i. 44); and the victims consisted of cow, a sheep, and a bull, which were led round the people ree times, and then slain; but this sacrifice was sometimes nitted on religious grounds (Liv., iii. 22). Varro (*De ing. Lat.*, v. 2) derives the word from *luere*, because the rmers paid their taxes at that time; but others, with ore probability, trace the etymology to the purifying saifice which was then offered.

It is well known that the most antient Roman year consted only of 10 months, or 304 days, and that this year ntinued to be used for religious purposes. Niebuhr, in s 'History of Rome,' has shown that the *lustrum* was e period, after which the beginnings of the civil and regious years were made to coincide; since 5 solar or civil ars of 365 days each, containing 1825 days, coincide with religious years of 304 days each, containing 1824 days, ith the difference of one day.

In the time of Domitian the name of *lustrum* was given the public games which were exhibited every fifth year honour of the Capitoline Jupiter. (Sueton., *Domitian*, 4.) The poets frequently used the word for any space of ve years (Hor., *Od.* ii. 4, 24; iv. 1-6), and sometimes conunded it with the Greek olympiad, which was only a space f four years. (Ovid, *Pont.*, iv. 6-5; Martial, iv. 45.)

(Niebuhr's *History of Rome*, vol. i., pp. 270-280, Eng. ansl.; Creuzer's *Abriss der Römischen Antiquitäten*, . 146; and the article Censor in this work.)

LUTE, a musical stringed instrument with frets, one of e numerous varieties of the antient cithara. Till towards e end of the seventeenth century its practice formed an esntial part of a good education, but it has since been partially perseded by the guitar: nevertheless the salaried office of *Lutenist* is still continued in the Chapel Royal, though the place is a sinecure. The derivation of the word seems to have perplexed many who have sought its etymology: it is, we have no doubt, to be traced to the Teutonic *Lut*, whence, modified, it has passed into all the European languages, whether cognate or otherwise.

We do not meet with any notice of this instrument, so named, before the time of Dante, who, ludicrously enough, compares the swelled figure of a person suffering under dropsy to the form of the lute. The shape of the body and principal or lower neck may be seen in our wood-engraving of the Arch-Lute. Mersenne, in his *Harmonie Universelle* (1636), describes the lute as consisting of three parts: the table, made of fir; the body or belly, of the same wood or cedar, constructed of nine convex ribs joined; and the neck, on which was fixed the finger-board, of hard wood, having nine frets made of catgut. To these is to be added the head or cross, in which the pegs or screws were placed. Thomas Mace, a celebrated teacher of the lute, in a curious work entitled *Musick's Monument* (1676), agrees in the description given by the learned French monk, adding a great number of other particulars relative to the construction and use of the instrument; to whose very remarkable folio we refer those who are desirous of minute information on the subject. We shall here only state, from the same writer, that the lute had at first six strings, or rather eleven, for the five largest were doubled; but that the number was gradually increased till it reached twenty-four. He tells us that in his time a very choice instrument fetched the sum of 100*l.*, which may be considered as equal to 400*l.* of our present money. [Arch-Lute; Guitar.]

The notation for the lute, theorbo, &c., called the *tablature*, differed entirely from that of other instruments. 'The chords,' says Sir J. Hawkins, 'are represented by a corresponding number of lines, and on these are marked the letters *a*, *b*, *c*, &c., which letters refer to the frets on the neck of the instrument. The time of the notes is signified by marks over the letters of a hooked form, that answer to the minim, crotchet, &c. This is the French tablature; but the Italians, and also the Spaniards, till of late years, made use of figures instead of letters.' There were many kinds of tablature, but being now obsolete and forgotten, it is unnecessary to add anything further concerning them.

LUTES, in chemistry, are substances employed in various operations for closing the joints of apparatus, and especially for connecting retorts and receivers so as to prevent the escape either of the vapour or gases generated during distillation or sublimation. The term lute is also applied to the external coating of clay and sand, or other substances applied to glass retorts, in order that they may support a high temperature without fusing or cracking. For operations on the large scale, as the distillation of aquafortis and muriatic acid, &c., common plastic clay is a sufficiently good lute. Sometimes it has been recommended to use what is termed *fat lute*, but this generally only in small distillations, as of nitric acid: this lute is prepared by mixing dried and powdered pipe-clay into a paste with linseed oil; and the joint is further secured, both where this lute is used and in many other cases, by tying it over with moistened bladder.

In most operations however a mixture of pipe-clay and meal, as linseed meal or almond powder, is quite sufficient, when secured by bladder, for any purposes, either when acids or ammonia are to be distilled. In luting common stills, in which oils or water are merely distilled, linseed meal and water, made into a paste, form an effectual lute.

In luting, or rather coating glass retorts, in order to enable them to sustain high temperatures, Stourbridge clay or Windsor loam mixed with tow have been used; but they require long drying, and are apt to crack. The simplest mode is that of brushing the retort over with a paste of pipe-clay and water, sifting sand upon it, drying it quickly in the ash-pit of the sand-heat; then covering it again with clay and sand, and repeating the alternate applications and drying till the coating is judged sufficiently thick.

LUTHER, LUDER, or LOTHER, MARTIN, born at Eisleben in Saxony, in November, 1483, was the son of Hans Luther, a miner and a worker in metals, who was a native of Eisenach. Young Martin was first sent to the school of Eisenach, where he spent four years, and in 1501 he went to the university of Erfurt. His father intended him to study the law, for which however he felt little inc nation, but he applied himself to literature and musi which latter he continued to cultivate during the rest of his life. While at Erfurt he appears to have exhibited the usual jovial careless disposition of a German student. In 1505 an accident occurred which altered the current of his thoughts. One of his fellow-students was killed at his side by lightning, and Luther from that moment made a vow to become a monk. On the 17th of July in the same year he entered the Augustine convent at Erfurt, carrying with him only a Virgil and a Plautus. His father was at first averse from this resolution; but after two years he consented, and was present at the ordination of his son in 1507. In the retirement of his convent Luther was tormented by temptations and religious scruples and doubts, which he has pathetically described, especially on the subjects of faith and salvation, until he at last adopted the principles of St. Augustin, or at least those ascribed to that Father, on grace and predestination. The provincial of his order, Staupitz, a man well-informed, honest, and kind-hearted, administered to him spiritual consolation, and appreciated his talents; and it was through his influence that, in 1508, Luther was appointed professor of philosophy in the university of Wittenberg. In his lectures, which were well attended, he appears to have discarded the scholastic forms which were prevalent at the time, and to have appealed to reason more than to authority. In 1510 he was sent by his superiors to Italy on business concerning the order, a circumstance which brought about a crisis in Luther's life. He proceeded to that country, which he looked upon as the centre of Christendom, with his heart full of spiritual hopes and devout expectations; but he was sorely disappointed and shocked at what he there saw. He found pomp and pride, gross sensuality, hypocrisy, and treachery, as he tells us, even in the convents which were his halting-places on the road. He told the monks at Milan that they ought to fast on Fridays, and he was nearly killed for his pains. His health became affected by these occurrences; he fell ill at Bologna, and was confined to his bed for some time. Having recovered, he continued his journey to Rome, and on his arrival repaired to the convent of his order near the gate Del Popolo. There he knelt on the ground, 'bathed with the blood of martyrs;' he hurried to the various sanctuaries with which the capital of the Christian world abounds; but on looking to those around him, the inmates of the Holy City, he found, to his surprise and grief, what many a young enthusiast has experienced before and since on entering the world, that names and realities, professions and practice, are quite different things. Luther was in fact single in his faith and his religious fervour. Rome at that time, after having passed through the scandalous pontificate of Borgia, was ruled by the choleric and warlike Julius II., who represented the church militant upon earth, and who was then busy about his schemes of humbling Venice and driving the French out of Italy. His cardinals were able diplomatists, men of the world, and learned Latinists, better acquainted with Cicero than with the Bible. In visiting the churches, Luther was shocked at the indecent hurry with which the priests went through the service of the mass, and at the blasphemous jests which he sometimes heard. Even the ministers of the altars made no secret of their unbelief. Luther remained only a fortnight at Rome: he hurried back to his native Germany with his head bewildered, his feelings distressed, and his religious belief greatly shaken. He used to say however, in after-years, that he would not, for one hundred thousand florins, have missed that journey to Rome, for without it he should have been tormented by the fear of being unjust towards the pope during his subsequent controversy with the papal power.

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* Mr. Bailey makes this star to be δ of Bayer, and the next λ.

In 1512 Luther was made doctor of divinity, and Frederic, elector of Saxony, called the Wise, defrayed the expense of his inauguration, which was celebrated with splendour. The reputation of Luther had spread as that of a learned divine and an eloquent preacher. He was well acquainted with scholastic learning, and tolerably so with the Fathers; he knew Greek, but very little Hebrew he had, above all, deeply studied the Scriptures, which was not a common attainment among ecclesiastics in those days. He was zealous and earnest, devotional in his thoughts, and irreproachable in his morals. In his own order he was appointed provincial vicar of Misnia and Thuringia, in which office he evinced much zeal for the maintenance of discipline and piety in the various monastic houses of that *province*.

In 1517 Pope Leo authorized by a bull the sale of indulgences in Saxony and other parts of Germany, as his predecessor Julius II. had done in France, Poland, and other parts, nominally for defraying the expenses of building the new church of St. Peter's, and also for supporting the league of the Christian powers against the Turks, though little of the money derived from the sale was employed for either purpose. [Leo X.] The practice of selling indulgences had existed for some centuries before Luther. For the original doctrine and practice of the Church on this matter see Indulgence. Leo addressed the papal commission for the sale in Saxony to Albert, elector of Mainz and archbishop of Magdeburg, who appointed Tetzel, a Dominican monk, his quæstor, to preach and sell the indulgences through the country. Tetzel appears to have executed his mission with the grossest quackery, enhancing his wares in the opinion of his uninformed and credulous customers by the most absurd exaggerations, and going far beyond the received doctrine of the Roman canonists even of that age. He pretended that his indulgences released not only from penance, but from sin altogether, and from any sin of whatever enormity. Luther, who was then professor of theology at Wittenberg, was shocked at these impious assertions, and while sitting at his confessional in the church of his convent he had practical proof of their mischievous effects. Some of his penitents, who had purchased the indulgences, refused to submit to the penance or reparation which he enjoined, saying that Tetzel had released them from every penalty. Luther having refused absolution, they went and complained to Tetzel, who threatened with both spiritual and temporal punishments all those who denied the efficacy of his indulgences. Luther, little heeding the threats of the Dominican, and being encouraged in his opposition by his own superior Staupitz, who also felt indignant at Tetzel's impudence, drew up ninety-five theses or propositions concerning indulgences, in which, drawing the distinction between the canonical penalties inflicted by the Church on the penitent sinner, and the penalties required here or hereafter by Divine justice, he maintained that the pope had the power of remitting the former only; that indulgences could not be applicable to the dead; that true contrition of heart and amendment of life would obtain pardon without any papal indulgences; that the true treasures of the Church were contained in the Gospel and in the operation of the Holy Ghost; that at all events, if indulgences be of any avail, they ought to be distributed gratis to the poor, and not to be made an article of trade: and here he exposed in strong colours the avarice, impudence, and licentiousness of the quæstors, and the fearful corruption of principles and conduct among the poor deluded population resulting from the whole system.

Luther enclosed a copy of his propositions in a letter to the archbishop of Magdeburg, dated 31st October, 1517, beseeching that prelate to interpose to prevent the further spreading of error, and to put a stop to Tetzel's scandalous practices. On the same day Luther affixed another copy of his theses on the gates of the Castle church of Wittenberg, signed with his name, and containing his offer to defend them. This was Luther's first challenge to that power which then kept all Europe in awe, and which he was destined to shake to its very foundations. Though in these celebrated theses there was nothing but what has been maintained by many Roman Catholics, still some of them were certainly at variance with the opinions generally entertained for three centuries before Luther's time, and also with the claim of infallibility assumed by the popes. From the pulpit of the same church Luther repeatedly expounded his propositions, and was eagerly listened to by crowded audiences. His theses spread with the greatest rapidity, and the main principle upon which they rested, namely, that indulgences could only remit the canonical or temporal penalty, gained ground universally throughout Germany. Tetzel and his brother Dominicans, after burning Luther's theses, attempted to answer them by counter-propositions mainly grounded upon the supreme authority of the pope and his infallibility. But this production injured Tetzel's cause, and a copy of it was publicly burnt by the Wittenberg students. Leo X., when he heard of the dispute, remarked, that it was but a quarrel between monks, and that brother Luther seemed to be a man of parts. The idle assertion which has been put forth by later writers, that Luther and his superior Staupitz were actuated by jealousy against the Dominicans for having the monopoly of the indulgences, has been triumphantly refuted by Dr. Maclaine in a note to Mosheim's 'Ecclesiastical History,' and the insinuation was never broached during Luther's lifetime by his most inveterate enemies. In fact the traffic in indulgences had fallen into contempt among the clergy, and the Franciscan friars themselves refused to have anything to do with it.

In the year 1518 Eckius, a professor of divinity at Ingolstadt, took up the controversy against Luther, who answered him, and thus increased his popularity and the number of his adherents, whilst at the same time the warmth of debate carried him beyond his original propositions and led him to touch on the abstruse subjects of free-will and the means of justification. Still it appears that Luther had as yet no intention of separating from the Roman Catholic Church. In May, 1518, he addressed a submissive letter to Leo X., in which he says, 'I throw myself prostrate at your feet, most holy father; call or recall me, approve or condemn me as you please; I shall acknowledge your voice as the voice of Christ, who presides and speaks in your person.' Leo summoned Luther to appear at Rome in sixty days, and there to plead his own cause; but the elector of Saxony interposed, and obtained permission for Luther to be examined within the bounds of the empire, and to be judged by its ecclesiastical laws. Cardinal Caietano, of the order of Dominicans, and papal legate at the diet of Augsburg, was ordered to examine him. Luther, accompanied by Staupitz and another friend, repaired to Augsburg, in October, 1518, and was received by the cardinal with courtesy; but instead of arguing the point with him, the cardinal assumed an imperious tone, and commanded him to retract because the pope so willed it, and how could he, Luther, a single monk, expect to be able to cope with the pope? (Luther's *Letter* to Spalatin, chaplain to the elector, and his friend, dated Augsburg, 14th October.) Luther replied that neither the legate nor the pope could pretend to infallibility, and that St. Peter himself had erred. In one of these interviews however the cardinal was insensibly drawn out from his high ground, and entered the field of controversy, but it would appear with little success. He rejected with scorn what he considered the novel doctrine of justification by faith and by faith alone. In the end, Luther, thinking perhaps of the fate of John Huss, suddenly quitted Augsburg, leaving behind an appeal to the pope 'better informed.' In November of the same year Leo issued a bull, declaratory of the doctrine of indulgences, asserting that the pope, as Christ's Vicar on earth, had the power of delivering from all the punishments due to sin those who had repented and were in a state of grace, whether they be alive or dead. On the 28th November Luther appealed from the pope to a general council of the church.

Meantime the cardinal legate was urging the elector of Saxony to expel Luther from his dominions. But the elector, who considered Luther as the pride and ornament of his newly founded university of Wittenberg, would not consent, and the emperor Maximilian I. having died just at this moment, Frederic, as hereditary vicar of the empire during the vacancy, was a person too important for even Rome to dictate to. Leo commissioned a new legate, a Saxon, named Miltitz, a man of sagacity and prudence, to endeavour to bring Luther to a reconciliation. Miltitz had a conference with Luther at Altenburg, in the beginning of 1519, in which he agreed with Luther in condemning the abuse made by Tetzel of the indulgences, threw the whole blame of it on that monk's ignorance and profaneness, and so far conciliated the warm but generous spirit of his antagonist as to induce him to write a submissive letter to Leo, dated 13th March, 1519, in which Luther acknowledged that he had carried his zeal and animosity too far, and promised to observe in future a profound silence upon the matter in debate, provided his adversaries would observe an equal temperance; further protesting that he never meant to deny the power of the pope, which was inferior only to that of Christ, and that he would always exhort the people to honour the Roman see, which he had in his writings endeavoured to clear from the impious exaggeration of the quæstors. 'This letter,' says Beausobre, 'is a sad monument of human weakness,' for Luther had already appealed from the pope to the council. Luther's vacillation however may be easily accounted for by reference to the old established reverence for the papal see, the reminiscence of his own early impressions and education, and of his solemn monastic vows, and also to the cordiality and convivial familiarity of his intercourse with Miltitz. It appears that Leo himself wrote to Luther a very mild and conciliatory epistle, published by Loscher in his *Unschuld Nachricht*, 1742. Miltitz had other conferences with Luther at Leibenwerd and Lichtenberg, which gave great hopes of a full reconciliation, when the polemic intemperance of Luther's personal adversaries widened the rupture and brought the dispute to a crisis. (Seckendorf, *Commentarius Histor. de Lutheranismo.*)

Eckius challenged Carlostadt, one of Luther's disciples, to a public disputation at Leipzig, concerning free-will. Carlostadt maintained that since the fall of our first parents our natural liberty is not strong enough to lead us in the path of good without the intervention of Divine grace. Eckius asserted that our natural liberty co-operates with divine grace, and that it is in the power of man to consent to the divine impulse or resist it. Eckius seemed to have the best of the argument on his side, when Luther, who had repaired to Leipzig, entered the lists against Eckius, by preaching in the chapel of Duke George's castle a sermon calculated to draw the hostility of Eckius against himself. Eckius, in fact, immediately selected from Luther's works thirteen propositions, which he met by as many counter-propositions. One was concerning the supremacy of the Roman see. Eckius maintained that the church was a monarchy with a head of divine appointment. Luther admitted this, but contended that the head was no other than Jesus Christ. The long acknowledged supremacy of the pope, he observed, extended only to the Western church, and he maintained that it was not *jure divino*, but founded on reasons of policy and tacit consent. Then came the subjects of purgatory and of indulgences, in which Luther had decidedly the advantage, and partly drew his antagonist to his side. Next were discussed the questions of absolution, grace, free-will, and good works, in which the Catholic divine appeared to prevail in point of argument. Hoffman, the rector of the university of Leipzig, who had been appointed judge of the disputation, refused to declare to whom the victory belonged, and the decision of the matter was referred to the universities of Paris and of Erfurt. Luther however went on publishing several works, 'On Babylonian Captivity,' 'On Christian Liberty,' &c., in which he openly attacked the doctrines and the authority of the church of Rome. Leo now assembled a congregation of cardinals, before whom the works of Luther were laid, and by whose advice a bull of condemnation was drawn up against Luther, and published on the 15th of June, 1520, in which forty-one propositions, extracted from his writings, were declared heretical, and as such solemnly condemned; his writings were ordered to be publicly burnt; and Luther himself was summoned to confess and retract within the space of sixty days, under pain of excommunication. Luther having again appealed to the general council of the church, publicly separated himself from the communion of Rome, by burning on a pile of wood, without the walls of Wittenberg, in presence of a vast multitude of people, Leo's bull, and also the decretals and canons relating to the pope's supreme jurisdiction. This was done on the 10th of December, 1520, and on the 6th of the following January the pope launched a second bull against him, by which Luther was expelled from the communion of the church for having disowned the supremacy of the Roman Pontiff.

Luther having now irrevocably separated from Rome, gave way to the violence of his temper in several vehement and scurrilous pamphlets, full of coarse vituperation against the pope, whom he openly styled Antichrist.

At the same time Leo urged the new emperor Charles V., in his character of advocate and defender of the church, to make an exemplary punishment of Luther as an obdurate heretic. But Frederic, the elector of Saxony, employed his influence with Charles to have Luther's cause tried by a diet of the empire, which assembled at Worms, in April, 1521.

Having obtained the emperor's safe conduct, he repaired to Worms, and was met by multitudes outside of the town. On entering he began singing the hymn 'Our God is a strong citadel,' which became known as Luther's hymn, and the inspiring song of the Reformation. On the 17th of April he appeared before the emperor, the electors, bishops, dukes, margraves, and other princes and lords assembled, and being asked whether he was the author of the books now produced, in which the propositions condemned by the pope were contained, he answered in the affirmative. Being next asked whether he would retract or maintain them, he begge for time to consider of his answer, and was allowed one day. The following day he appeared again before the assembly, and said that his writings were of various character, that in some he had treated only of Christian faith and piety, and these could contain nothing objectionable; that in some he had exposed the inventions of men and the usurpations of the popes, and these he could not retract; that in others, which were directed against the defenders of the pope, he might have expressed himself in an unbecoming manner, but that he could not retract the substance however censurable the manner of it; that, being a man, he was liable to error, and that he was ready, if convicted by the testimony of the Scriptures, to commit a portion or the whole of his publications to the flames. And he repeated what he had already said on another occasion, that both pope and council were liable to error, and had in fact often erred. He had formerly quoted the council of Constance as an instance of his assertion.

On the following day Charles V. told the diet, that attached as he was to the Roman Catholic church, he should ever defend its doctrines and constitution, that he could hear Luther no more, and that he should dismiss him, and afterwards treat him as a heretic. This decision was also that of the majority. Some were for trying persuasion and entreaty with a man who, like Luther, could not be frightened into submission; but entreaty was likewise of no avail, for Luther refused to retract a single proposition unless proved to be erroneous by the authority of the Scripture. He was then ordered to leave Worms, with a written promise of security for twenty-one days. He left on the 26th of April, but on entering a forest his carriage was stopped by a party of armed horsemen in masks, who placed him on horseback and rode off with him to the solitary castle of Wartburg, situated on a mountain. This was another contrivance of his kind protector the elector of Saxony. The greatest secrecy was observed concerning the place of his retreat, and it was purposely reported about that his enemies had carried him off. A month after his departure an imperial edict appeared, placing Luther under the ban of the empire, ordering him to be seized and retained in prison at the emperor's pleasure, and imprisonment and confiscation were denounced against any one who aided and abetted him. But the edict could not be enforced. The elector of Saxony was Luther's friend; few, if any, of the other electors or princes were his enemies, and the popular voice was for him: for the Germans in general, although few of them understood the subject matter of Luther's polemics, were weary of the abuses and encroachments of the ecclesiastical power.

In his asylum at Wartburg Luther wrote several treatises against auricular confession, against monastic vows, clerical celibacy, and prayers for the dead, against the Sorbonne of Paris, which had condemned his works, and which he exposed to public ridicule. His writings spread and produced a wonderful effect in Saxony. Hundreds of monks quitted their convents, and married. The Austin friars of Wittenberg abolished the mass. Carlostadt, a disciple of Luther, but more intemperate than his master, accompanied by a band of reformers, demolished the images in the church of All Saints at Wittenberg, and next proposed to banish all books from the university except the Bible. He also affected to obey to the letter the sentence pronounced on Adam by going to work in the fields for some hours daily. Even the polished Melancthon followed the example, and went to work in a baker's shop.

Luther, in his retirement, heard of these follies; he perceived that fanaticism was spoiling his cause, and he resolved immediately, without heeding his own danger, to return to Wittenberg (1522). He rebuked Carlostadt, who retorted, calling him an idolater because he believed in the real presence in the sacrament, and a courtier for living on terms of intimacy with princes. At last they parted in anger; Carlostadt was banished from Saxony as a seditious person by the elector, for inculcating the principles of natural equality, and he went to join Zuingli in Switzerland.

Luther was now the acknowledged leader and oracle of the reformers of Germany, and as such he continued to the end of his life. The doctrines which he gradually asserted, and which were expounded and fixed by his disciple Melancthon, in the Confession of Augsburg, are stated in the article PROTESTANTISM. At the close of 1522 he published his German version of the New *Testament.* In 1523 he preached against the mass. He had already replied in his usually scurrilous style of polemics to the treatise in defence of the sacraments written by Henry VIII. of England. It must be observed however that the coarse vituperations which shock the reader in Luther's controversial works were not peculiar to him, being commonly used by scholars and divines of the middle ages in their disputations. The invectives of Valla, Filelfo, Poggio, and other distinguished scholars against each other are notorious, and this bad taste continued in practice long after Luther down to the seventeenth century, and traces of it are found in writers of the eighteenth, even in some of the works of the polished and courtly Voltaire.

In 1524 Luther threw off his monastic dress, and definitively condemned monastic institutions. Convents, both of men and women, were now rapidly suppressed throughout North Germany, and their property was seized by the secular power: indeed there can be no doubt that the hope of plunder contributed greatly to the encouragement which the princes and electors gave to the new doctrines. The insurrection of the *wiedertaüfer*, or anabaptists, led by a fanatic named Muntzer, which assumed the character of a peasant war against all property and law, gave great concern to Luther, who was taunted by many with being the source from which all those aberrations flowed. He preached against the fanatics, he tried to mediate, he besought the peasants to lay down their arms, and at the same time he told the princes to redress the grievances of the poor; but the insurgents were too far gone in their brutal career of bloodshed and devastation, and nothing but the sword could put a stop to it. Luther was sorely grieved throughout the rest of his life at the renewed disorders of the anabaptists and other fanatics on one side, and on the other at the selfishness, worldliness, and corruption of all classes. He fancied at times that the end of the world must be nigh, for the world had fallen into decrepitude; avidity and self-interest were the ruling passions. (Luther's *Table Talk;* and his *Letters.*)

In 1525 Luther married Catherine de Bora, a young nun who had left her convent the year before. He had long before condemned the obligation of clerical celibacy, as well as that resulting from monastic vows, as being human devices unknown to the original church. 'Marriage in its purity,' he wrote, 'is a state of simplicity and peace.' When Luther married he was poor, for amidst the great change from the old to the new system of church discipline, his salary, which was charged upon the revenues of monastic property, was by no means regularly paid, and Luther was not a man to ask money of his friends. In the same year his steady and considerate patron Frederic of Saxony died; but John, his successor, not only continued to favour Luther, but made open profession of his doctrines, and commissioned him to prepare a new church service for his dominions, in addition to which Luther wrote a larger and a small catechism for the use of schools, in a style admirably suited to youth. Besides the elector of Saxony, the Elector Palatine, the landgrave of Hesse, the duke of Deux Ponts, the margrave of Brandenburg and grand-master of Prussia, and also many cities in other parts of the empire, openly embraced Luther's reformation. In Switzerland however another reformer, Zuingli, who had begun, like Luther, by opposing indulgences, had also effected a reformation, but he inculcated tenets different in some respects from those of Luther, especially on the subject of the real presence in the sacrament, which Luther admitted, and Zuingli entirely denied. Luther was vexed at this division, especially as several towns of Germany, Strasburg, Ulm, Meiningen, Lindau, Constance, and others, adopted Zuingli's tenets.

In March, 1529, a diet was convoked at Speyer, in which the Catholics endeavoured to enforce the edict of Worms, but the opposition of the elector of Saxony, the landgrave of Hesse, the margrave of Brandenburg, and the deputies of the imperial cities, caused its rejection. The Catholics then endeavoured to separate the reformers; they drew up a decree, apparently directed against those who denied the real presence, but so worded as to include the Lutherans also, who refused their sanction to it. It was on this occasion that the reformed princes and deputies delivered a formal 'protestation' against the decree, dated Speyer, 19th of April, 1529, which was signed by John, elector of Saxony, George, margrave of Brandenburg, Philip, landgrave of Hesse, Ernest and Francis, dukes of Lüneburg, Wolfgang, prince of Anhalt, and the deputies of fourteen cities. From this protestation arose the name of 'Protestants,' which in its origin was applied to the Lutherans.

The landgrave of Hesse, wishing if possible to bring about a union among all reformers, succeeded in appointing a conference between Luther and Melancthon on one side and Zuingli and Œcolampadius on the other at Marburg. The conference turned chiefly on the subject of the real presence, but it produced no approximation among the opposite parties. They separated neither in friendliness nor hostility, and both parties retained their favourite tenets.

In 1530 a diet was convoked at Augsburg by Charles V., who attended it in person, and there the Lutherans presented their confession of faith, which was drawn up by Melancthon and approved by Luther. [Augsburg, Confession of.]

In 1534 Luther completed his greatest work, the German version of the Bible, which is much admired for its elegance, force, and precision, and which has rendered the Scriptures really popular in Germany.

The remaining years of Luther's life were passed in comparative quiet, chiefly at Wittenberg, in the duties of his professorship, in writing religious and controversial tracts, and in epistolary correspondence. He was consulted by the Protestant princes and clergy upon all important matters, and listened to with deference. The pacification of Nürnberg in 1532 had left the Lutheran princes, states, and towns in full possession of their religious liberties; and that peace was not openly interrupted till after Luther's death. Luther had the satisfaction of seeing his doctrines spread farther and farther through Germany, thoughout Saxony and Brandenburg, to Moravia and Bohemia, Denmark, and Sweden. He also effected a reconciliation with the so-called Sacramentarians of Strasburg, Ulm, and other towns, by means of Bucer, so that all reformed Germany was united under one banner. The Helvetic reformed churches however continued separate from his.

At the beginning of 1546 Luther repaired from Wittenberg to Eisleben for the purpose of reconciling the counts Mansfeld, whose subject he was born. He attended several conferences for that benevolent purpose, and succeeded in restoring peace to that family. While at Eisleben he preached four times, and also revised a plan of regulations concerning the ecclesiastical discipline of that little state. He had been for some time in a very precarious state of health: on the 17th February he felt very ill and weak, laid himself on a couch, spoke of his approaching death, for which he appeared quite prepared, and recommended his soul to Jesus. He grew worse in the evening. Count Albrecht of Mansfeld and his countess and several medical men attended him during his last hours. His old friend Dr. Jonas having asked him: 'Reverend father, do you die with a firm conviction of the faith you have taught?' Luther in a distinct voice replied 'Yes,' and soon after breathed his last. His body was carried to Wittenberg, where it was buried with great honours. Shortly before his death he wrote several affectionate letters to his wife, who had remained at Wittenberg with her children. He left her by his will a house which he had purchased, as well as a small estate at Zeilsdorf, charging her to pay his debts, which amounted to 450 florins; and he left her also a few valuable trinkets and other moveables, worth about 1000 florins. 'I leave,' he wrote, 'no ready cash or hidden treasure, as I have had no other income but my salary and a few presents, and yet have managed to keep an establishment and purchase property'

Luther's works, which are multifarious and voluminous, partly in Latin and partly in German, have been repeatedly published. The latest edition is that of Erlangen, 26 vols. 12mo., 1826-33. Among his works, those of most interest to the general reader are his 'Table Talk,' *Tischreden*, his familiar letters, and his sermons. Luther ranks high among German writers for the vigour of his style and the development which he imparted to his vernacular language. Schroeck, Melancthon, and others have written biographies of Luther, and Michelet has extracted a kind of autobiography from numerous passages of his works: 'Mémoires de Luther, écrits par lui-même, traduits et mis en ordre,' 2 vols. 8vo., Paris, 1835. From these passages the character of Luther is clearly deduced, for there was no calculation, reserve, or hypocrisy about him. He was frank and vehement, and often intemperate. But he was in earnest in his vehemence; he really felt the importance of the topics he was discussing; and whether he was right or wrong in his peculiar opinions, he was a sincere and zealous believer in the Christian Revelation. Luther considered religion as the most important business of man, and because he considered it as such, he wished to ascend to its very source unalloyed by human authority. He contended for the right of every man to consult the great book of the Christian law; and although he insisted upon his own interpretation of particular passages of the scriptures, the principles of free inquiry which he introduced led to further results, and gradually established that liberty of conscience which now exists in the Protestant states of Europe. But Luther himself, whilst he appealed to the scriptures against human authority, did not for a moment admit of any doubts concerning the truth of revelation. The question between Luther and his antagonists is therefore of material importance chiefly to Christians. To those who do not believe in Christianity it may appear of little consequence what Christians do believe, or how and whence they derive their belief; but even in a social point of view it is of some importance to decide whether large multitudes of men are to exercise their own judgment and be able to give reasons why they believe certain doctrines, or whether they are for ever to repeat, generation after generation, whatever they have been taught in their youth, without exercising their reasoning powers on the matter.

Those who judge of Luther's disposition merely from his controversial style and manner greatly mistake his character. He was a warm-hearted German, kind and generous; he abused and vilified his antagonists the more in proportion as they were powerful, but he could feel for the unhappy, and he even tendered some consolation to his bitterest enemy Tetzel, when, forsaken by his employers, and upbraided as the cause of all the mischief, he was in the agonies of death and despair.

Luther gave that impulse towards spiritual philosophy, that thirst for information, that logical exercise of the mind, which have made the Germans the most generally instructed and the most intellectual people in Europe. Luther was convinced of the necessity of education as auxiliary to religion and morality, and he pleaded unceasingly for the education of the labouring classes, broadly telling princes and rulers how dangerous as well as unjust it was to keep their subjects in ignorance and degradation. He was no courtly flatterer: he spoke in favour of the poor, the humble, and the oppressed, and against the high and mighty, even of his own party, who were guilty of cupidity and oppression. Luther's doctrine was altogether in favour of civil liberty, and in Germany it tended to support constitutional rights against the encroachments of the imperial power.

Luther's moral courage, his undaunted firmness, his strong conviction, and the great revolution which he effected in society, place him in the first rank of historical characters. The form of the monk of Wittenberg emerging from the receding gloom of the middle ages, appears towering above the sovereigns and warriors, statesmen and divines of the sixteenth century, who were his contemporaries, his antagonists, or his disciples.

(J. Alb. Fabricius, *Centifolium Lutheranum*, 2 vols., 1728-30, gives a list of all the authors who had then written concerning Luther and his Reformation.)

LUTON, is a parish in the hundred of Flitt and county of Bedford, comprising the township of Luton and the hamlets of East and West Hyde, Leegrave, and Stopsley. The town, which is situated on the right bank of the Lea, 18 miles south by east from Bedford, and 29 north-west by north from London, is, we believe, neither paved nor lighted, but the inhabitants are well supplied with water from the river. The making of straw-plat and malting constitute the chief manufactures of the place. The living is a vicarage in the patronage of the Marquis of Bute, and valued at 830*l.* per annum. Besides almshouses and a few other benevolent institutions, there is a national-school which is usually attended by a considerable number of children. The population of the entire parish in 1831 was 5693, that of the township alone being 3961. (*Ecclesiastical Revenues Report*; *Population Returns*, &c.)

LUTRA. [Otter.]

LUTRA'RIA. (Conchology.) [Pyloridea.]

LUTRI'COLA. (Conchology.) [Pyloridea.]

LUTTERWORTH. [Leicestershire.]

LÜTZEN. [Gustavus Adolphus.]

LUXEMBOURG, or LUXEMBURG, a grand-duchy or province in the Netherlands, the sovereignty of which at this time (February, 1839) forms a subject of dispute between Holland and Belgium. The king of the Netherlands became grand-duke of Luxembourg by the arrangements of the Congress of Vienna, and as such a member of the Germanic Confederation. [Belgium.] Luxembourg is bounded on the east by the Prussian Rhenish provinces, on the north by Liege, on the west by Namur, and on the south by the French departments of the Moselle and Ardennes. Its greatest length from east to west is 75 miles, and its greatest breadth is 50 miles; its area is 690,000 hectares (equal to 1,700,000 English acres), or 2656 square miles, distributed as follows:—

	Hectares.
Woods and plantations .	211,000
Arable land, pastures and meadows	240,000
Heaths and commons . .	127,000
Uncultivable land, marshes, &c.	88,240
Roads, &c. . .	23,760
	690,000

The principal rivers of Luxembourg are, the Moselle, which for twenty-five miles forms the boundary between this province and Prussia; the Sûre, an affluent of the Moselle, and also a boundary through part of its course between this province and the Prussian territory; the Our and the Elze or Alzette, which fall into the Sûre; the Semois, which rises near Arlon, and, flowing first to the west and then to the north, falls into the Maas; the Ourthe, which rises near Bastogne, and falls into the Maas near Liege; the Lesse, which rises near Neufchâteau, and also falls into the Maas near Dinant. There are also several small streams, which have the appearance of rivers only when swollen by rains.

Luxembourg is crossed from the south-west to the north-east by a range of high ground, part of the Ardennes, which separates the valley of the Maas from that of the Moselle. This range has a mean elevation of 1800 feet above the Maas at Liege, and 1640 feet above the level of the Moselle on the French frontier. The soil of this elevated region is calcareous, which character extends on both sides of the range, and forms a band about 25 miles wide, which is principally occupied as pasturage. The lower lands, which are commonly called the *good country*, are very productive, and yield abundant harvests of wheat and rye, as well as flax, hemp, mangel-wurzel, and all kinds of legumes. Such of the high lands as are applied to arable cultivation rarely yield anything but rye, oats, and potatoes. Luxembourg contains many woods of large growth. The agriculture of this province is said to be inferior to that of any other part of the Netherlands. The vine is cultivated on the banks of the Moselle and the Sûre; and in 1837, the most abundant vintage on record, there were produced 75,503 hectolitres (1,661,066 gallons) of wine. The quality of the wine of the district is inferior. In the same districts are upwards of 2000 distilleries, nearly two-thirds of which have been established since 1832. The quantity of spirit distilled in 1837 was 4,116,420 gallons, from which it is evident that the establishments are generally upon a very small scale.

At the beginning of 1835 there were in the province 32,585 horses, 122,288 horned cattle, and 167,532 sheep; and in the course of that year there were exported 5 horses, 172 horned cattle, and 7536 sheep and lambs, besides 22,217 hogs, of the number of which no account has been taken; they must however be very numerous, as there is scarcely a family in the province by whom swine are not bred and reared. The branches of industry, not agricultural, pursued in Luxembourg, besides distilling, are those of iron-works, slate-quarries, potteries, tanneries, cloth-mills, and paper-mills. The quantity of iron made is about 9000 tons in a year, the ore for which is found in the eastern and western parts of the province. The fuel employed in the smelting-furnaces is wood-charcoal. Luxembourg contains lead and copper. At Stolzembourg, a village about seventeen miles north of the city of Luxembourg, a copper-mine was worked in 1749, 1764, and 1768, and in 1772 was abandoned as being exhausted. There is a lead-mine in work at Longwilly, near Bastogne, but the produce is not great.

Luxembourg is less densely peopled than any province of Belgium. The number of inhabitants, on the 1st of January, 1837, was 323,219, of whom 15,693 only were living in towns, and 307,526 in rural districts. In 1836 there were born in the towns 322 male and 283 female children, and in the country 5678 male and 5469 female children; all together, 11,752. The number of deaths in that year was, in towns 231 males and 194 females, in the country 3588 males and 3408 females; all together, 7421. It appears from an authentic document that the population of Luxembourg in 1541 was only 95,058 souls. In 1784 there were, in the towns of Luxembourg, Arlon, and Echternach, 12,874, and in the rest of the province 211,220 inhabitants; all together, 224,094. In 1817 there were only 213,597 souls, but since that time the increase has been rapid. In 1828, when the population was 302,654, there were 302,251 Catholics, 68 Protestants, and 335 Jews.

The moral condition of the inhabitants is said to be superior to that of any province in Belgium, a fact which is sometimes attributed to the small number of towns and to the minute division of the land, which is such as to make proprietors of the majority of the labouring people. To these causes may be added the absence of wealth and consequently of temptation to commit offences against property, which form the great majority of charges brought before the tribunals in richer and more densely peopled communities. The province does not contain any considerable libraries nor museums of natural history. Some antient abbeys in former times possessed considerable collections of books, but they have long since been dispersed, and even in the city of Luxembourg there is now no collection that would be considered remarkable if possessed by a private person.

The youths of Luxembourg have no college within the province which they can attend, and are accustomed to go for instruction to Louvain, to Liege, and to Paris. There were in 1833, in all Luxembourg, 779 primary schools, attended by 39,114 scholars of both sexes. The number has increased since that time, and every village or hamlet has now its primary school, the teacher of which is chosen by the heads of families.

The city of Luxembourg, the capital of the province, is a fortress of great strength, in 49° 37′ N. lat. and 6° 9′ E. long., on the Elze: 66 miles south-south-east from Liege, 25 miles south-west from Treves, and 100 miles south-east from Brussels. The city is surrounded by strong walls and deep ditches, and has a double line of outworks in the form of a heptagon. It is small but well built, has four churches, a military hospital, and a newly built market-place; its population is 11,500. Luxembourg as a fortress belongs to the Germanic Confederation, and is occupied by their troops. The town of Arlon is 10 miles north-north-west from Luxembourg. [Arlon.] Echternach, on the right bank the Sûre, 13 miles north-east from Luxembourg, has a population of 3417, who are occupied with the manufacture of pottery, woollen cloths, and other less important matters. The town is surrounded by a wall, and has five gates; it contains 527 houses, 1 church, 3 chapels, a town-hall, and an hospital. Other towns of the province are St. Hubert, in the Ardennes, formerly the seat of a rich Benedictine abbey, and a place of pilgrimage, with 1500 inhabitants; Bouillon, the capital of the duchy of the same name [Bouillon]; Neufchâteau, in a wild district of the Ardennes, with 1200 inhabitants; Bastogne, in a plain in the Ardennes, with 2400 inhabitants; Diekirck on the Sûre, with 2500 inhabitants; and Grevenmachern, in a pleasant country on the Moselle, where a considerable quantity of wine is made. [Ardennes.]

LUXOR. [Egypt; Thebes.]

LUZE'RN (*Lucerne* in French), a canton of Switzerland, bounded on the north by Aargau, on the east by Schwytz and Zug, on the south by Unterwalden, and on the west by Bern. Its greatest length, from north to south, is 33 miles, and its greatest breadth 27. Its area is reckoned at 657 miles. The declivity of the valleys is towards the north-east and north-west. The southern part of the canton belongs to the basin of the Reuss, which issues out of the Waldstätten lake at the town of Luzern, and flows in a north-east direction into Aargau. Below Luzern the Reuss is joined by the Wald Emme, which rises at the south-west extremity of the canton, runs northward through the fine district called the Entlibuch, and then flows north-east until it meets the Reuss. A succession of high grounds, running across the middle of the canton, divides the basin of the Reuss from that of the Aar, to which latter river the northern part of Luzern belongs. The Suhren flows out of the Sempacher lake, which is in the centre of the canton, and runs northward towards the

Aar. The Wigger rises in the centre of the canton, south-west of the lake of Sempach, and runs northward into the Aar. North-east of the Sempacher lake is another and smaller lake, called the Baldegger lake, from which a stream runs into the Halwyler lake, which is in Aargau, but touches the borders of Luzern, and from which a river runs into the Aar. The only mountains in the canton are at its southern extremity, on the borders of Unterwalden and the Bernese Oberland. None of them attain the limits of perpetual snow. The highest is Mount Pilatus, south-west of the town of Luzern, and a conspicuous feature in its landscape. It is a mountain-group nearly thirty miles in length, extending along the borders of Luzern and Unterwalden, and having seven peaks or summits, called Esel, Oberhaupt, Band, Tomlishorn, Gemsmätli, Widderfeld, and Knappstein. The Tomlishorn, 6858 feet, and the Esel, 6678 feet, are the highest summits. The name of Pilatus is said to be derived from the Latin word 'pileatus,' because the mountain-top is often covered with clouds as with a hat. The local legend of the peasantry derives it from Pilate, the governor of Judæa, who is said to have wandered into Helvetia, and to have drowned himself in a lake on this mountain. It is also called Fracmont, 'Mons fractus,' because its sides, especially towards Luzern, look broken, craggy, and inaccessible. The southern side towards Alpnach in Unterwalden is less abrupt, and it is covered with forests which belong to that canton. The most practicable path for ascending the Pilatus is on that side. The view from its summits is very extensive. The soil of Luzern is fertile; it is one of the very few cantons of Switzerland which produces more corn than it consumes, and the excess is purchased by the neighbouring Waldstätten, or pastoral cantons. Fruit-trees are also abundant; the vine is cultivated only in some favourable situations. The rearing of cattle is the principal branch of industry in a great part of the canton, especially in the Entlibuch. In some districts of the canton are manufactories of linen and cotton goods. The trade between Switzerland and Italy by the St. Gothard employs a number of people, and all the goods pass through Luzern and the lake of the Waldstätten.

The population of the canton in 1836 was 123,407 inhabitants, of whom only 3585 were natives of other countries. They are exclusively Catholic. German is the language. Under the former system Luzern was a municipal aristocracy, the majority in the legislative council being monopolized by the citizens of the head town. In 1831, the country-people having strongly remonstrated against this arrangement, a new constitution was framed, by which all the citizens of the canton, of the Catholic faith, being above 20 years of age, and having a property of 600 francs and paying taxes thereupon, have a vote in the elections. The great council consists of 100 members, of whom 18 are returned by the town of Luzern, and 62 by the rest of the canton: these 80 deputies appoint the remaining 20, of whom 7 must be from the town of Luzern. The qualifications for a deputy are, 25 years of age and a taxed property of 3000 francs. Every two years one-third of the council is renewed. The great council appoints 15 of its members to form the little council, or executive, at the head of which is a schultheiss or avoyer, who is renewed annually. The supreme court of justice consists of fifteen members chosen by the great council, one-third of whom are renewed every two years. The canton is divided into twenty-five electoral circles, and into five administrative districts, namely, Luzern, Sursee, Entlibuch, Willisau, and Hochdorf. The public revenue of the canton is 367,642 Swiss livres (the Swiss livre is one franc and a half of France, or about 15 pence sterling), and the expenditure 347,380 livres. The monopoly of salt, which is in the hands of the government, as in most Swiss cantons, brings in 102,000 livres to the revenue; the ohmgeld, or tax on the vineyards, 118,000 livres; the postages 24,000; the tolls 17,000; stamps 10,000; the contributions at which monastic and other ecclesiastical foundations are assessed amount to 19,425 livres. The abbey of Münster, or Beromünster, founded in 850, and the convent of St. Urban, are among the wealthiest in Switzerland. Luzern is in the diocese of the bishop of Basel, who resides at Soleure.

There are in the canton 165 primary or elementary schools, and 16 secondary or grammar schools, a seminary for teachers, a gymnasium, a lyceum, and a polytechnic institute.

LUZE'RN, the town of, is situated at the western extremity of the lake of the Waldstätten, and is divided into two unequal parts by the Reuss, which issues out of the lake. The larger part, which is on the right bank, is built on the slope of a hill: the whole is surrounded by old walls flanked by towers, and has a fine appearance from the lake, being in the midst of a delightful and well-wooded country interspersed with neat country-houses, with Mount Pilatus rising on one side, and Mount Rigi on the opposite side of the lake. The interior of the town is not so pleasant, the streets being narrow, uneven, and ill paved. The remarkable buildings are: 1, the town-house, with some fine rooms adorned with paintings; 2, the college of the Jesuits, with a fine painting by Torriani; 3, the arsenal, which contains some relics of the battles of Sempach and Morat; and 4, the three covered wooden bridges, which are the chief curiosities of Luzern. They are built on the lake, and serve as a promenade: the Hofbrück is 1380 feet long, and is painted with subjects taken from the Bible; the Kapellbrück is 1000 feet long, and its paintings relate to the history of Switzerland; the Spreuerbrück, which is short, has some paintings of the 'Dance of Death.' The parochial church and cemetery are outside of the town, and are well worth visiting. The topographic map, in relief, of the country round the Waldstätten See, by the late General Pfyffer, who spent more than 10 years of his life in constructing it, is one of the most remarkable things at Luzern. It is 22 feet long and 13 feet wide, and contains the cantons of Uri, Schwytz, Unterwalden, Zug, and part of Luzern. The materials are pasteboard, wax, and resin.

In a secluded spot in the neighbourhood of Luzern is the monument erected in 1821 to the memory of the Swiss guards who died in the defence of the Tuileries against the mob of Paris, on the 10th August, 1792. It consists of a wounded and dying lion, of colossal size, in alto rilievo, sculptured on the side of a rock, in a kind of niche. The model for it was sent by Thorwaldsen from Rome. The names of the officers, 26 in number, who, with 760 soldiers, fell on that memorable occasion, as well as those officers, 16 in number, who, with about 350 soldiers, survived it, are engraved underneath. The lion is represented grasping a shield with a fleur-de-lys on it, and a bundle of broken arms with the Swiss cross are lying on one side.

Luzern contains 8150 inhabitants. It has two hospitals, a savings' bank, a friendly society, and other benevolent institutions. It has also a musical society, a collection of minerals, and very good elementary and secondary schools, each divided into three classes. Luzern is the principal of the Catholic cantons, and the Pope's nuncio resides here. (Leresche, *Dictionnaire Géographique Statistique de la Suisse*; also an anonymous work entitled *Slight Reminiscences of the Rhine and Switzerland*, 2 vols., London 1834, which contains some curious particulars of Luzern life, manners, and scenes.)

LUZON. [PHILIPPINE ISLANDS,]

LYCA'ON. [HYÆNA-DOG.]

LYCAO'NIA (Λυκαονία, and the inhabitants Λυκάονες), a district of Asia Minor, is first mentioned by Xenophon, who describes it as extending eastward from Iconium in Phrygia to the beginning of Cappadocia, a distance of 30 parasangs, about 110 English miles. (*Anab.*, i. 2, s. 19.) It was united during the Persian monarchy to the satrapy of Cappadocia. (Xen., *Anab.*, vii. 8, s. 25.) But in the time of Strabo the name of Lycaonia was applied to the south-eastern part of Phrygia; and it was bounded on the south by Mount Taurus, on the east by Cappadocia, and on the west by Pisidia.

Lycaonia is described by Strabo as high table-land, deficient in water, which the inhabitants could only procure by digging deep wells, but well adapted for sheep, of which Amyntas had upwards of 300 flocks (xii. c. vi., vol. iii., p. 58, 59, *Tauchnitz*). Iconium, the principal town of Lycaonia, called by Abulfeda *Kunijah*, and at present *Konieh* (Strabo, *ut supra*; Cic., *Fam.*, xv. 4; Plin., *Nat. Hist.*, v. 25), was situated in a fertile plain at the foot of Mount Taurus. Konieh contains at present a population of about 30,000 inhabitants. (Hassel, *Erdbeschr. Asiens*, ii. 197.) Isauria is mentioned by Strabo as part of Lycaonia; it contained the cities of Larauda, Lystra, and Derbe; the two last of which were visited by Saint Paul, and appear, from the narrative in the *Acts*, to have been places of considerable importance. (*Acts*, xiv. 6.)

The northern part of Lycaonia was united, but at what time is uncertain, to Galatia; but the southern part was governed in the time of Cicero (*Fam.* xiii. 73) by an independent prince of the name of Antipater, who resided at Derbe. Antipater however being afterwards conquered by Amyntas, king of Galatia, the whole of Lycaonia fell under the power of the Galatians. At the death of Amyntas, B.C. 25, Lycaonia, together with Galatia, became a Roman province. (Dion. Cass., liv., p. 589, *Stephan.*) In the time of Pliny Lycaonia formed a separate tetrarchy, which contained 14 towns. (*Nat. Hist.*, v. 25.)

The language of Lycaonia mentioned in the *Acts*, xiv. 11, has occasioned much dispute among the learned; of which an account is given in Jablonsky's 'Opuscula,' ed. Te Water, iii. 3.

LYCESTA, Savigny's name for a genus of crustaceans, which M. Desmarest views as coming very near to the genus *Mæra* of Leach.

LY'CIA (Λυκία), a province of Asia Minor, was bounded on the north by Phrygia, on the east by Pamphylia, on the west by Caria, and on the south by the Mediterranean Sea. The interior of this country was entirely unknown till the recent visit of Mr. Fellows (1838), who travelled a considerable distance into the interior, and made many interesting discoveries, which will be shortly communicated to the world by the publication of his journal. We are informed by him that the country is erroneously represented in all the maps, and that there are no mountains of any importance in the interior. The coast is surrounded by lofty mountains, which rise in many places to a great height. Mount Solyma, called at present Takhatlu, to the north of Phaselis on the borders of Pamphylia, rises to the height of 7800 feet. [ANATOLIA, i., p. 493.] According to Strabo (xiv., c. iii., vol. iii., p. 213, *Tauchnitz*) there is a great number of good harbours, notwithstanding the rocky nature of the coast. The length of the coast, from Telmissus on the west to Phaselis on the east, is said by Strabo to be 1720 stadia. The northern part of Lycia is occupied by the mountains which support the high table-land of Phrygia on the south, and which appear to have been known to the antients under the name of Massicytus. Mount Massicytus is erroneously placed in most maps in the centre of the country, where there are no mountains, according to Mr. Fellows. The Xanthus, which is also represented as an inconsiderable stream, is in reality a river of considerable length, flowing from the mountains in the north of Lycia; and the whole of the interior, instead of being occupied by mountains, as was commonly thought, is, on the contrary, a fertile plain, surrounded by mountains on every side, and drained through its whole extent by the river Xanthus.

According to Herodotus the Lycians were originally called Milyans, and afterwards Solymi; but again changed their name to that of Termilæ, after Sarpedon settled in the country, having been compelled to leave Crete in consequence of dissensions with his brother Minos. They were, according to the same authority, eventually called Lycians from Lycus, the son of Pandion, who came to Lycia after he had been expelled from Athens by his brother Ægeus. (Herodot., i. 173. Compare Strabo, vol. iii., p. 217, 218.) In the Homeric poems the country is always called Lycia, and the Solymi are mentioned as a warlike people against whom Bellerophon is sent to fight by the king of Lycia (*Il.*, vi. 184). In later times the southern part of Phrygia, on the north of Lycia, was always called Milyas; but the people are never called Solymi, though the name still remained in Mount Solyma on the north-eastern coast. That Lycia was early colonized by the Greek nation is evident, not only from the account of Herodotus, but also from many other Lycian traditions, as well as from the worship of Apollo, which was spread over the whole country. Xanthus was a Cretan settlement (Steph. Byz.), and 60 stadia below the town was a grove sacred to Latona, near an antient temple of the Lycian Apollo (Strabo, vol. iii., p. 215; Diod., v. 56). But the chief temple was at Patara, the winter habitation of the god, where he gave oracles through the mouth of a priestess. (Müller's *Dorians*, i., p. 245, Engl. transl.)

The Lycians appear to have obtained considerable power in early times. They were almost the only people west of the Halys who were not subdued by Crœsus (Herodot., i. 28); and they made an obstinate resistance to Harpagus, the general of Cyrus, but were eventually conquered. (Herodot., i. 176.) They suppli[illegible] ships in his expedition against Gr[illegible] After the downfall of the Persi[illegible] subject to the Seleucidæ, till the conquest of Antiochus by the Romans, when their country, as well as Caria, was granted by the conquerors to the Rhodians (Polyb., p. 848, *Casaubon*); but their freedom was afterwards again secured to them by the Romans (Polyb., p. 925), who allowed them to preserve their own laws and their political constitution, which is greatly praised by Strabo. According to this account (vol. iii., p. 214) the government was a kind of federation consisting of 23 cities, which sent deputies to an assembly, in which a governor was chosen for the whole of Lycia, as well as judges and inferior magistrates. All matters relating to the government of the country were discussed in this assembly. The six principal cities, Xanthus, Patara, Pinara, Olympus, Myra, and Tlos, had three votes each; other cities two votes each; and the remainder only one each. In consequence of dissensions between the different cities, this constitution was abolished by the emperor Claudius (Suet., *Claud.*, c. 25; compare *Vespas.*, c. 8); and the country united to the province of Pamphylia. (Dion. Cass., lx., p. 777, *C. Steph.*)

Lycia contained many cities of considerable importance. Pliny (*Nat. Hist.*, v. 28) mentions 36, but says that there were formerly as many as 70. Telmissus, on the borders of Caria, a seaport with a good harbour, must have been a place of some importance in the time of Crœsus (Herodot., i. 78), but afterwards declined in power; it is mentioned by Strabo as a small place. South of Telmissus, on the coast, were the towns of Pynda, Cragus, and Patara; the last of which is described by Strabo as a large city with many temples in it, and is said by Livy (xxxvii. 15) to have been the capital of Lycia. According to Pliny, the antient name of this town was Sataros (*Hist. Nat.*, v. 28); but the name was afterwards changed by Ptolemy Philadelphus into Arsinoe. (Strabo, vol. ii., p. 215, 216.) To the north of Patara, on the river Xanthus, were the towns of Xanthus (which was burnt by its inhabitants, when they could no longer resist Brutus) and Tlos; and to the east, along the coast, those of Myra (mentioned in the *Acts*, xxvii. 5, as a seaport, but placed in most maps in the interior), Limyra, and Olympus. The position of Pinara is doubtful: it is put down in the maps on the river Xanthus, above the town of the same name; but the numerous inscriptions which Mr. Fellows found at this spot, called at present *Doover*, prove that this was the position of Tlos. Between Myra and Olympus was the sacred promontory, stretching out a considerable distance into the sea, off which were the Chelidonian islands. On the borders of Pamphylia was the important town of Phaselis, founded by the Dorians. (Herodot., ii. 178.) It had three harbours (Strabo, vol. iii., p. 217), and was one of the most flourishing commercial cities on the southern coast of Asia Minor. It was one of the principal resorts of the Cilician pirates in the later times of the Roman republic, and was destroyed for this reason by Paulus Servilius. (Cic., *Verr.*, vi. 10.) It was afterwards rebuilt, and is mentioned by Lucan (viii. 251); but it never recovered its former importance.

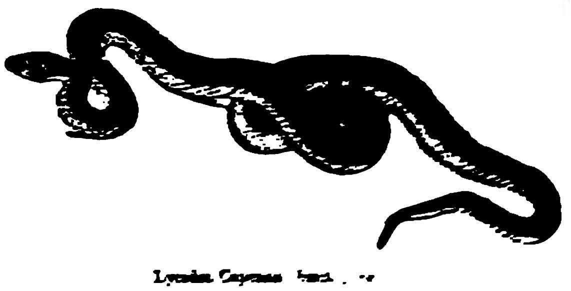
LY'CIUM. Many antient authors, and among others Dioscorides, describe under the above name a substance as used in medicine, which is stated to be of two kinds; one obtained from Lycia and Cappadocia, and the other from India. The former is said to be the produce of a thorny shrub called Pyxacantha. The latter is stated to be more valuable and efficacious as a medicine, and to be produced also by a thorny shrub which is called Lonchitis.

Most modern authors have stated these plants and the substance they produce to be totally unknown; others consider species of Rhamnus, or the common box, to be alluded to. Prosper Alpinus thought Berberis Cretica to be one of the plants; while Garcias ab Orto thought Catechu to be the substance, and Acacia Catechu the plant yielding it. It is possible that some species of Rhamnus, as R. infectorius, of which both the root, wood, and berries possess medicinal properties, and which are in the present day used for dyeing yellow, may have formed one of the kinds of Lycium, as it is common in the countries where the first kind is said to have been produced, and some species of Rhamnus were by the older botanists called Lycium. Though there is uncertainty about the Lycium of Asia Minor, that of India seemed to have been quite unknown until the publication of a paper 'On the Lycium of Dioscorides,' by Dr. Royle, in the Linnean Society's Transactions for 1833, where it is stated that there is no proof that Catechu was the λύκιον ἰνδικόν (*Lycium indicum*) of the antients; in fact is ncompatible with the evidence adduced on the subject from)riental writers. The Greek authors on medicine having been ranslated into Arabic, and from this language into Persian, nd these, with additions, forming the works now in use in ndia, we may expect to find in them some trace of Lyium; and in fact in that called *Makhzun-al-Udwieh*; *loofyon* is mentioned as the plant which yields *huzis*, and in Persian it is called *feel-zukreh*. *Loofyon* is evidently written for *lookyon*, through an error of the transcriber in a diacritical point, in the same way that Filafoos (Philip of Macedon) has been changed in some of these works into *Filakoos*. This is further evident indeed from referring to the Latin translations of Serapion and Avicenna, where *hadad* and *feel-zuhuruj* are translated Lycium and Lycium indicum. In the Persian work, hoozuz or hooziz (the same word as hadad) is described as being of two kinds: one from India, of which the Hindee name is *rusot*; and the other from Arabia. The Persian name *feel-zuhreh* is translated in our best dictionaries 'box-thorn,' that is, Pyxacantha. The best kind of rusot is said, in the *Makhzun-al-Udwieh*, to be brought from Nuggur-kote in the neighbourhood of Lahore, and that it is an extract made from a decoction of the fresh wood of *dar-huld*. On inquiring in the shops of the druggists in the bazars of India, Dr. R. learned that both the wood *dar-huld* and the extract *rusot* were imported into the plains of India from the Himalayas. On travelling in these mountains, and on wishing to be shown the plant which produced the wood called *dar-huld* as well as that from which the *rusot* was procured, species of Berberry were immediately pointed out, and it was stated that both the wood and the extract were procured indifferently from *Berberis asiatica*, *B. aristata*, *B. Lycium*, and *B. pinnata*. On cutting into the wood of each, and having some converted into extract, he found both to correspond in every respect with what he had bought in the plains under the name of *dar-huld* and *rusot*. The extract *rusot* is procurable in the bazars of India, being much employed by the native practitioners of medicine in India, as an external application rubbed over the swollen eye-lid either simply or in combination with opium and alum and a little water or oil, both in incipient and chronic inflammation of the eye. The wood of Berberry being employed both in Europe and India as a yellow dye, it has been suggested by Mr. E. Solly, in a paper read before the Royal Asiatic Society, that the root, wood, or extract might be imported from India for the use of the manufacturers of Europe. This notice may appear disproportioned to the importance of the subject, but it is interesting as showing the knowledge which the Greeks had of the products of India, at the same time that it proves the great extent to which the influence of their own works has spread.

LY'CODON, a genus of serpents.

Example, *Lycodon Capensis*, Smith (*Lycodon Horstockii*, Schlegel).

Description.—Shining greenish-brown above, head without variations, and the scales along the middle of the back less distinctly marked with white specks than those of the sides.



Lycodon Capensis [illegible]

Dr. Smith, who recorded this species in [illegible] the 'South African Quarterly Journal,' figures and describes in the 4th number of the 'Illustrations of the Zoology of South Africa' (1838), now in the course of publication,* a variety of a shining umber-green colour above, tinged with purple, the head reticulated with white lines, and the scales white at the tips; greenish yellow below; eyes livid green. Length from nose to tail 12 inches; of the tail two inches.

Locality of the variety above described, among decayed wood, near a small stream, immediately beyond Kurrichane, lat. about 25° south.

Habits, &c.—'When,' continues Dr. Smith, 'by the removal of some of the rotten masses, the reptile was exposed, it moved slowly among the remaining ones in search of a place of concealment; and when it was interrupted in its advance, it simply coiled itself up without manifesting any disposition to resist the opposition offered; a similar course I had previously observed others of the same species pursue when attempts were made to secure them; and neither did the one here described nor the others ever move with any considerable rapidity, nor appear much in fear of their assailants. All the specimens which I have seen of this species were obtained in damp situations, and never remote from localities where they could rapidly and without much exertion conceal themselves if necessary; and in the latter respect they resemble most of the innocuous snakes of South Africa, which are not endowed with the powers of effecting rapid movements.'

LY'COPUS EUROPÆUS, a wild plant inhabiting wet ditches and sides of ponds, belonging to the natural order Labiatæ, and known popularly under the name of gipsywort, because gipsies are said to stain their skins with its juice.

LYCOPERDON, a genus of fungi, emitting when burst, either by violence or natural dehiscence, a quantity of dust-like seeds or spores, whence the species are commonly called puff-balls. The old botanists collected under this name a variety of plants, very different from each other in many respects, although agreeing in the circumstance just mentioned: recent writers have distinguished them as so many distinct genera. The only two which it is necessary to mention here are the common puff-balls, which burst irregularly, and the starry puff-balls, which split in a definite stellate manner. They are each inhabitants of meadows, pastures, woods, lawns, &c., and some of the species are exceedingly common. When the common puff-ball, Lycoperdon gemmatum, first appears, it forms a whitish ball, looking like a common edible mushroom, but by degrees it changes colour, becomes brown, and bursting irregularly at the apex, discharges a cloud of brownish dust, consisting entirely of its spores. The Geasters, or starry puff-balls, are much less common: [illegible] at the apex when ripe, their outer coat separates into a definite number of lobes, which spread open, curve backwards, and at last [illegible] the spores. No use has ever been made of any of the Lycoperdons, except in the case of L. giganteum, a very large subterranean species which may be as much as a foot in diameter, and filled with a spongy tissue, which has been employed as a styptic and for tinder.

LY'COPHRIS. [illegible]

LY'COPHRON, a native of Chalcis in Eubœa, the son of Socles and adopted by the historian Lycus of Rhegium, was a distinguished poet and grammarian at the court of Ptolemy Philadelphus from B.C. 285 to B.C. 247, where he formed one of the seven poets known by the name of Pleiades. It is said by Ovid to have been killed by an arrow ('Ibis,' [illegible]).

Lycophron wrote a great number of tragedies, the titles of many of which are preserved by Suidas; but only one of his works now extant is entitled 'Cassandra,' or 'Alexandra.' [illegible] who lived in the 12th century of the Christian æra, is still extant, and affords no small assistance in making out the meaning of this difficult poem.

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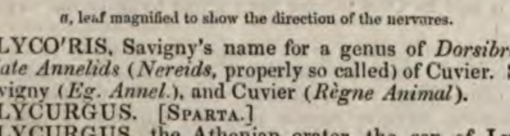
* Published under the authority of the Lords Commissioners of Her Majesty's Treasury, and containing figures and descriptions of [illegible] of the animals of South Africa, collected during an expedition into the interior in the years 1834, 1835, and 1836, [illegible] Good Hope Association for exploring Central Africa.

The 'Cassandra' was printed for the first time at the Aldine press, Venice, 1513. The best editions are by Potter, Oxf. 1697, 1702; by Reichard, Leip. 1788; by Sebastian, Rome, 1804; and by Bachmann, Leip. 1833. The commentary of Tzetzes has been published with most of the editions of the 'Cassandra;' and has also appeared in a separate form under the superintendence of C. G. Müller, Leip. 1812 The 'Cassandra' has been translated into English by Lord Royston.

LYCOPODIA'CEÆ, a natural order of vascular Acrogens, chiefly consisting of moss-like plants, inhabiting moors, boggy heaths, and woods in many parts of the world. They never exceed the height or length of two or three feet, and usually grow prostrate, having their stems covered with numerous imbricated scale-like leaves, which, at the ends of the branches bear in their axils bivalve cases containing an inflammable powder, sometimes extremely fine, and used for artificial fireworks, which is supposed to be their spores. No distinct trace of two kinds of sexes has been found in these plants, which seem to have no very close allies among existing races. Their resemblance to ferns, near which systematists always place them, chiefly consists in their being asexual, and having spiral vessels in their stems. Some of them, especially Lycopodium rubrum, are violent purgatives, and it has been proposed to use others as dyes, but in general they are of little importance to any except the botanical systematist. Their name has however of late been brought frequently before the public in popular works, in consequence of an opinion that certain large fossils common in the coal-measures, and called Lepidodendra, are the relics of an extinct gigantic race of these now pigmy species. This opinion has been formed upon the supposition that the dichotomous mode of branching, common in Lycopodiaceæ, is a circumstance of paramount importance in determining natural affinities, and that the Lepidodendra were asexual. The latter is however not proved, nor indeed very probable, and the internal anatomy of Lepidodendron Harcourti has been shown, in the 'Fossil Flora,' to be unfavourable to the supposition. (*Fossil Flora*, article 'Lepidodendron Harcourti;' and Adolphe Brongniart's *Végétaux Fossiles*, article 'Lycopodiaceæ.')

LYCOPODITES. The affinity of many fossil plants to some of the various genera composing the Lycopodiaceæ is very distinctly pointed out by M. Brongniart, both in the 'Prodrome' (1828) and in the 'Histoire des Végétaux Fossiles.' Such of these as agree in the following characters are ranked under the title of Lycopodites.

Branches pinnate; leaves inserted all round the stem, or in two opposite rows, not leaving distinct and circumscribed cicatrices. Several species are described from the coal deposits and oolitic formations. We give below a drawing of part of Lycopodites falcatus (Phillips's *Geol. of Yorkshire*) from the oolitic shales of Gristhorpe, near Scarborough.



a, leaf magnified to show the direction of the nervures.

LYCO'RIS, Savigny's name for a genus of *Dorsibranchiate Annelids* (*Nereids*, properly so called) of Cuvier. See Savigny (*Eg. Annel.*), and Cuvier (*Règne Animal*).

LYCURGUS. [SPARTA.]

LYCURGUS, the Athenian orator, the son of Lycophron, and the grandson of Lycurgus, who is ridiculed by Aristophanes (*Birds*, l. 1296), was one of the warmest supporters of the democratical party in the contest with Philip of Macedon. The time of his birth is uncertain, but he was older than Demosthenes (Liban., *Arg. Aristogiton*); and if his father was put to death by the Thirty Tyrants (*Vitæ Decem Orat.*, p. 841, B.), he must have been born previous to B.C. 404; but the words of the biographer are, as Mr. Clinton has justly remarked (*Fast. Hell.*, vol. ii., p. 151), ambiguous, and may imply that it was his grandfather who was put to death by the Thirty.

Lycurgus is said to have received instruction from Plato and Isocrates. He took an active part in the management of public affairs, and was one of the Athenian ambassadors who succeeded (B.C. 343) in counteracting the designs of Philip against Ambracia and Peloponnesus. (Demosth., *Philip*, iii., p. 129, ed. Reiske.) He filled the office of treasurer of the public revenue for three periods of five years, that is, according to the antient idiom, twelve years (Diod. Sic., xvi. 88); and was noted for the integrity and ability with which he discharged the duties of his office. Böckh (*Public Economy of Athens*, vol. ii., p. 183, Engl. transl.) considers that Lycurgus was the only statesman of antiquity who had a real knowledge of the management of finance. He raised the revenue to twelve hundred talents, and also erected during his administration many public buildings, and completed the docks, the armoury, the theatre of Bacchus, and the Panathenaic course. So great confidence was placed in the honesty of Lycurgus, that many citizens confided to his custody large sums of money; and shortly before his death he had the accounts of his public administration engraved on stone and set up in part of the wrestling-school. An inscription, preserved to the present day, containing some accounts of a manager of the public revenue, is supposed by Böckh (*Public Economy of Athens*, vol. i., p. 264) to be a part of the accounts of Lycurgus. (See the inscription in Böckh's *Corpus Inscriptionum Græcarum*, vol. i., p. 250, No. 157.)

After the battle of Chæronea (B.C. 388) Lycurgus conducted the accusation against the Athenian general Lysicles. He was one of the orators demanded by Alexander after the destruction of Thebes, B.C. 335. He died about the year B.C. 323, and was buried in the Academia. (Pausan., i. 29, § 15.) Fifteen years after his death, upon the ascendency of the democratical party, a decree was passed by the Athenian people that public honours should be paid to Lycurgus; a brazen statue of him was erected in the Ceramicus, which was seen by Pausanias (i. 8, § 3), and the representative of his family was allowed the privilege of dining in the Prytaneum. This decree, which was proposed by Stratocles, has come down to us at the end of the 'Lives of the Ten Orators.'

Lycurgus is said to have published fifteen orations (*Vitæ Dec. Orat.*, p. 843, C.; Photius, *Cod.*, 268); of which only one has come down to us. This oration, which was delivered B.C. 330, is an accusation of Leocrates (*κατὰ Λεωκράτους*), an Athenian citizen, for abandoning Athens after the battle of Chæronea, and settling in another Grecian state. The eloquence of Lycurgus is greatly praised by Diodorus Siculus (xvi. 88), but is justly characterized by Dionysius of Halicarnassus as deficient in ease and elegance (vol. v., p. 433, ed. Reiske).

The best editions of Lycurgus are by Taylor, who published it with the 'Oration of Demosthenes against Midias,' Camb., 1743; Becker, 1821; Pinzger, 1824, Blume, 1827; and Baiter and Saupp, 1834. It is also included in the edition of the 'Oratores Græci,' by Reiske and Bekker, and has been translated into French by Auger, Paris, 1783.

(Dionysius of Halicarnassus; *Life of Isocrates*, attributed to Plutarch; Preface to Taylor's edition of Lycurgus; Nissen's dissertation, *De Lycurgi Oratoris Vita et Rebus gestis*, 1833. Compare Böckh's *Public Economy of Athens*, vol. i., pp. 264-269; vol. ii., pp. 183-188, Engl. transl.)

LYCUS, River. [ANATOLIA.]

LYDFORD, a village in the west of Devonshire, seven miles north of Tavistock, now almost deserted, and visited only for the sake of a waterfall or cataract in the Lyde, near a bridge where the stream is pent in between high rocks. When the river is full, this waterfall is a very pleasing object, though Risdon ('Survey of Devon') says, 'It maketh such an hideous noise, that being only heard and not seen, it causeth a kind of fear to the passengers, seeming to them who look down to it, a deep abyss, and may be numbered among the wonders of the kingdom.' This now insignificant village was formerly a frontier town of considerable strength and importance, having 140 burgesses within the walls, and many without, and protected by a castle, erected probably by the Saxons, when they had driven the West Britons across the Tamar. Lydford was burnt by the Danes in 997. It is recorded in Domesday as a manor and borough in antient demesne, having formed part of the possessions of the crown in the time of Edward the Confessor, and as not being liable to any impost, except at the same time, and for the same causes, as London. Lydford appears however to have been tallaged with Exeter, Axminster, Witeford, and ten other towns, in 20 Henry II.

(1174); and in the fifth year of John (1203), that king, for the small sum of 5 marks (3*l.* 13*s.* 4*d.*), entered into an engagement with H. de la Pomeraie, that he would not grant to the burgesses of Lydford better liberties than those enjoyed by the citizens of Exeter. (Madox, *Exch.*, 282, note (t.) 485.) When in the possession of his son Richard, king of the Romans, it had a market, which had been renewed in 1130 ('Magn. Rot. Scacc.') and a fair. (*Cal. Rot. Chart.*, 97, 102.)

The parish of Lydford is one of the most extensive in the kingdom, including the high morass called the Chace or Forest of Dartmoor, formerly Dertemore, which occupies the centre of the county of Devon.

Lydford, with Dartmoor, was commonly annexed in royal grants to the earldom of Cornwall, and in 6 Edward II., after the forfeiture of Gaveston, we find Thomas Le Ercedekne committee of the earldom (1 *Abbr. Rot.*, Origin. in Scacc. 186, 195, 196), and also constable of Lydford Castle, and keeper of the forest of Dartmoor. (*Ibid.* 196 b.) Lydford and Dartmoor were inalienably incorporated with the dukedom of Cornwall upon its creation in 1339, in favour of the Black Prince.

Lydford Castle, sometimes called the castle of Dartmoor, (*Cal. Rot. Pat.*, 249) is an extensive building, though now very dilapidated. It is the Stannary Castle, and contains the rooms where the warden of the stannaries of Devon, an office sometimes granted to the abbot of Tavistock (2 *Parl. Rolls*, 10 b.), or the vice-warden, held his stannary courts; it had dungeons for the reception of delinquent tinners. By the charter of Edward I., the tinners of that county were not to be imprisoned elsewhere. In the last year of this king' reign, the warden of the stannaries claimed the body of tinner who had been imprisoned upon a charge of killing his brother's son; but upon an inspection of the charter it was found to contain a reservation of cases of life and member. The privilege of imprisoning at Lydford became the subject of a complaint in parliament at the close of the reign of Edward III., 1377, when it was asserted by the commons, that the warden of the stannaries took prisoners arrested for arrearages of account out of other gaols and kept them at Lydford, where there was sometimes no gaol delivery for ten years, and where these supposed tinners were so favourably treated, that they thought of anything but paying their debts. (2 *Parl. Rolls*, 344.) This complaint does not seem to accord with the popular notion that 'by Lydford law' men are hanged first and tried afterwards.

The parliaments, or convocations, of tinners for Devon, were held on a high rock in Dartmoor, called Crockern Torr, where stood a table and seats, the whole being hewn out of the granite surface, without any neighbouring building or protection from the weather. The stannators of the stannaries of Devon (called sometimes the stannaries of Dartmoor, *Cal. Rot. Pat.*, 23 b.), who composed these parliaments, were elected by the mayors, or other chief magistrates, of the four coinage towns, Chagford, Ashburton, Plympton, and Tavistock, though in the beginning of the reign of Edward III. there appears to have been a contention between the latter place and the three former, as to the privilege of coinage. (*Cal. Inq. post Mort.*, 10.) The table, round which these legislators assembled, and the seats which they occupied, have ceased to exist. These interesting remains were some years since broken to pieces and removed by the workmen of the late judge Sir Francis Buller, who, unfortunately for those who respect the relics of by-gone usages, had purchased an estate in this parish, and the fragments of these venerable monuments were employed in the construction of a modern mansion.

Like other border districts Lydford presents some peculiarities in respect of tenures. It is said (5 *Co. Rep.*, 84) the custom of Lydford Castle is, that freeholders of inheritance cannot pass their freeholds except by surrender into the hands of the lord. This particular form of restriction upon alienation appears to have been by no means unusual. ('Year Book,' 14 Henry IV., fo. 1.) Risdon mentions other peculiarities annexed to the tenures of the freeholders in Lydford, called the Fenfield men, formerly the Fengfield men. The term may have been originally 'fangfield,' the Anglo-Saxon (and German) verb 'fangen,' to receive (preterite 'fing'), being still current throughout Devonshire, where however the preterite is become regular, 'fanged.'

Though Dartmoor is a bleak unsheltered morass, we find that in the time of Henry III. 'David de Seyredun held a yard-land (virgata terræ, sometimes 20, sometimes 48 acres) in Seyredun and Sappesby, by the service of the serjeanty of finding two arrows when the king came to hunt in the forest of Dartmoor, and so held his ancestors since the Conquest' (Testa de Nevile, 195), and that Richard de Droscombe held a yard-land of the (yearly) value of half a mark (6*s.* 8*d.*), in the hundred of Exminster by the serjeanty of carrying the king's bow when he hunted in Dartmoor (*Ibid.*, 196). It also appears that the service of Odo *le Archer* in Droscomb was to present a bow and three arrows when the king hunted in Dartmoor (*Ibid.* 197).

LYDGATE, JOHN, an antient English poet, one of the successors of Chaucer, was a monk of the Benedictine abbey of Bury St. Edmund in Suffolk. The dates of only a few of the events of his life have been ascertained. He was ordained a subdeacon in 1389, a deacon in 1393, and a priest in 1397; whence it has been conjectured that he was born about 1375. Warton says he seems to have arrived at his greatest eminence about the year 1430. After a short education at Oxford, he travelled into France and Italy, and returned a complete master of the language and literature of both countries. He chiefly studied Dante, Boccaccio, and Alain Chartier, and became so distinguished a proficient in polite learning, that he opened a school in his monastery for teaching the sons of the nobility versification and composition. Although philology was his subject, he was not unacquainted with the philosophy of the day: he was not only a poet and a rhetorician, but a geometrician, an astronomer, a theologist, and a disputant. Warton was of opinion that Lydgate 'made considerable additions to those amplifications of our language, in which Chaucer, Gower, and Occleve led the way;' and that he was the first of our writers whose style was clothed with that perspicuity in which the English phraseology appears at this day to an English reader.

To enumerate Lydgate's pieces would be to write the catalogue of a little library; Ritson, in his 'Bibliographia Poetica,' has given a list of no fewer than two hundred and fifty-one. No poet seems to have possessed greater versatility. His most esteemed works are his 'Story of Thebes,' his 'Fall of Princes,' and his 'History, Siege, and Destruction of Troy.' The first is printed by Spight in his edition of Chaucer; the second, the 'Fall of Princes,' or 'Boke of Johan Bochas' (first printed by Pynson in 1494, and several times since), is a translation from Boccaccio, or rather from a French paraphrase of his work, 'De Casibus Virorum et Feminarum Illustrium.' 'The History of Troy' was first printed by Pynson in 1513, but more correctly by Marshe in 1555, and was once the most popular of his works.

A pension of 7*l.* 13*s.* 4*d.* for life was granted to Lydgate by King Henry VI. in 1440, probably upon the presentation to that monarch, when he visited St. Edmunds Bury, of a MS. Life of St. Edmund, the patron saint of the monastery. This manuscript is still preserved in the Harleian collection in the British Museum, No. 2278, and is one of the most splendidly illuminated MSS. in that great repository, which also contains in the old Royal, Cottonian, Harleian, and Lansdowne Collections, other splendid manuscripts of Lydgate's various poems.

A note in Wanley's part of the Harleian Catalogue of Manuscripts seems to insinuate that Lydgate did not die till 1482, which is improbable. He was certainly alive in 1446; and the best authorities place his death about 1461.

(Warton's *Hist. Eng. Poet.*, 4th edit., vol. ii., p. 51-100; Ritson, *Bibliographia Poetica*, p. 66-90; Ellis's *Specimens*; Chalmers's *Biogr. Dict.*, vol. xxi., pp. 5, 6.)

LY'DIA (Λυδία), a country of Asia Minor. It is difficult to determine its exact boundaries, as they differed at various times; but under the Roman empire it was bounded on the south by Caria, from which it was separated by the river Mæander; on the north by a range of mountains known under the name of Sardene, which divided it from Mysia; on the east by Phrygia; and on the west by the Ægean, though the tract of country along the coast was more commonly known by the name of Ionia. Lydia was intersected by mountain-ranges, running from east to west; of which the principal, called Méssogis by Strabo, is a branch of Taurus, and forms the northern boundary of the valley of the Mæander. Another chain of mountains, known to the antients under the name of Tmolus, which appears to detach itself from the Méssogis near the borders of Phrygia, runs parallel to the Méssogis through the centre of Lydia and terminates on the western coast opposite the island of Chios. A branch of Tmolus, called Sipylus, stretches more to the north-west towards the towns of Cuma and Phocæa. The chain of mountains which separates Mysia from Lydia appears to be a continuation of the northern range known in Bithynia by the name of Olympus, and in Mysia by that of Ida and Temnon. Lydia is thus divided into two principal valleys; the southern, between Méssogis and Tmolus, through which the Caystrus flows, is of moderate extent; but the northern, between Tmolus and Sardene, watered by the Hermus, and its tributaries the Hyllus, Pactolus, and Coganus, forms a considerable plain. The fertility of Lydia and the salubrity of the climate are frequently mentioned by antient writers; and this account is confirmed by the reports of modern travellers. (Chandler's *Travels in Asia Minor*, p. 260; compare Arundell's *Visit to the Seven Churches of Asia.*) Chishull speaks of the country between Tmolus and Méssogis as a 'region inexpressibly delicious.'

The origin of the Lydian people is uncertain. Some writers, and among others Josephus (*Antiquit.*, i. 6, 4), have imagined that they are mentioned in the book of *Genesis* (x. 22) under the name of Lud (לוד); in which passage they are described as descendants of Shem. Homer does not appear to have known the name of Lydia, but always calls the people Mæones. According to most antient writers, the people were originally called Mæones, and obtained the name of Lydians from Lydus, the son of Atys, who is mentioned by tradition as the first king of the country. (Herodot., i. 7; Diod. Sic., iv., p. 237, Rhodoman; Pliny, *N. H.*, v. 30.) Later writers make a distinction between Mæonians and Lydians, and represent the former as dwelling on the north-east of Tmolus, near the river Hyllus, and the Lydians as inhabiting the southern part of the country. According to Herodotus, the Lydians were of a common origin with the Carians and Mysians (i. 171).

The early history of Lydia is related by Herodotus, who informs us that three dynasties ruled in Lydia: the *Atyadæ* from the earliest times to B.C. 1221; the *Heraclidæ* from B.C. 1221 to 716; and the *Mermnadæ* from B.C. 716 to 556. The proper history of Lydia can only be said to begin with the last of these dynasties; since the two first are almost entirely fabulous. The following is a list of the Mermnadæ princes: 1. Gyges, who obtained the throne by the murder of Candaules, the last of the Heraclidæ monarchs, reigned from B.C. 716 to 678. 2. Ardys, from B.C. 678 to 629. 3. Sadyattes, from B.C. 629 to 617. 4. Alyattes, from B.C. 617 to 560. [ALYATTES.] 5. Crœsus, from B.C. 560 to 556, though he was probably associated in the sovereignty during the lifetime of his father. [CRŒSUS.] These monarchs were engaged in almost uninterrupted wars with the Greek cities on the coast; but the empire steadily increased in wealth and power. It obtained its greatest prosperity during the reign of Crœsus, who subdued all the people of Asia Minor west of the river Halys (*Kisil-ermak*), with the exception of the Cilicians and Lycians. (Herodot., i. 28.) But this empire, the most powerful at that time in Western Asia, was overthrown by Cyrus (B.C. 556); and the country became a Persian province. Herodotus informs us that no nation in Asia was more warlike than the Lydians (i. 79); till, through the advice of Crœsus, they were deprived of their arms by Cyrus, and obliged to learn music and dancing (i. 154). After Alexander's conquests, Lydia, with the rest of Western Asia, formed part of the empire of the Seleucidæ; and on the conquest of Antiochus by the Romans, B.C. 189, it was given to Eumenes, king of Pergamus, as a reward for the assistance he had afforded them in their war against the Syrian monarch. (Liv., xxxvii. 56; Appian, *Syr.*, 38; 1 *Macc.*, viii. 8.) On the death of Attalus III., B.C. 133, it came, with the other dominions of the kings of Pergamus, into the power of the Romans.

The antient Lydians appear to have enjoyed great commercial prosperity and to have possessed abundance of the precious metals; as is evident from other circumstances, and particularly from the rich presents which Crœsus sent to the different oracles in Greece. (Herodot., i. 50.) The Lydians are said to have obtained a large quantity of gold which was washed down from the mountains by the river Pactolus; but there is no proof that they ever carried on the operation of mining. (Herodot., i. 93; v. 101; compare Heeren's *Researches*, &c., 'Asiatic Nations,' vol. i. p. 106, 107, Eng. transl.) But in the time of Strabo no gold was found in this river (xiii. 928); and if Herodotus had been misinformed, which is improbable since he visited Sardis, the tale might easily have arisen from the appearance of Mount Tmolus, which, according to a modern traveller, 'is adorned with bright and shining particles, resembling gold-dust.' (Chishull, quoted by Chandler, *Travels in Asia Minor*, p. 260.) The Lydians are said by the Greeks to have been the first people who put a stamp upon gold and silver; and they claimed to be the inventors of the games which were prevalent in Greece in the time of Herodotus (i. 94).

The most extraordinary work of art in antient Lydia was the enormous sepulchral mound of Alyattes, the father of Crœsus, erected a little to the north of the river Hermus. Herodotus classes it next to the great works of the Egyptians and Babylonians, and describes it as 6 stadia (about three-quarters of a mile) and 2 plethra (200 feet) in circumference; and 13 plethra (1300[*] Greek feet) in width. The basement was built of great stones, and the upper part of earth. (Herodot., i. 93.) Chandler visited the spot in which this mound is supposed to have been raised; he describes the ground as covered with earthen barrows or mounds of various sizes, and mentions one in particular, near the middle, larger than the rest, which he supposes to have been the sepulchral mound of Alyattes, and conjectures that the basement of stone is now concealed by the mould, which has been washed down from the top. (*Travels*, p. 263; compare Arundell's *Visit*, &c., p. 186.) In the neighbourhood of this mound is the lake known to the antients by the name of Gygæa. (Homer, *Il.*, ii. 864; Herodot., i. 93.) It is described by Chandler as large and abounding in fish; its colour and taste like common pond-water, with beds of sedge growing in it. (*Travels*, p. 262.)

The Grecian towns on the coast of Lydia are described under IONIA. The most important of those towns which properly belonged to Lydia were Sardis, Philadelphia, and Thyatira.

Sardis (Σάρδεις, Σάρδις, Σάρδιες), called at present *Sart*, is situated on the river Pactolus, a tributary of the Hermus, in the middle of an extensive plain. The citadel was remarkable for its strength, being situated on a lofty hill, which was a perpendicular precipice on the back part, which looked towards Mount Tmolus. It is not mentioned by Homer, but some have conjectured that he speaks of it under the name of Hyde (ὕδη, *Il.*, xx. 385). Sardis was taken by the Cimmerians during their invasion of Lydia, in the reign of Ardys. (Herodot., i. 15.) It was the capital of the Lydian monarchy, and the residence of the Persian satraps of the country. It was burnt by the Athenians, B.C. 503 (Herodot., v. 100, 101); at which time the houses were principally made of reeds or straw, and those built of brick had thatched roofs. Under the Romans, Sardis formed the seat of a separate provincial government. ('Sardiana Jurisdictio,' Pliny, *N. H.*, v. 30.) It was nearly destroyed by an earthquake in the time of Tiberius (Tac., *Ann.*, ii. 47); but it was again rebuilt, and is frequently mentioned in the wars between the Greeks and Turks. Sart is at present a 'miserable village' (Chandler's *Travels*, p. 255); but there are large ruins of the antient Sardis in the neighbourhood.

Philadelphia (Φιλαδέλφεια) called at present *Allah Shehr* (that is, *City of God*), 28 miles south-east of Sardis (Anton., *Itin.*, p. 336), stands on a part of Mount Tmolus, by the river Coganus. This town was built by Attalus Philadelphus, king of Pergamus; and is still a place of some importance. Chandler speaks of it as 'a mean but considerable town, of large extent, spreading on the slopes of three or four hills.' (*Travels*, p. 249.) To the east of Philadelphia Strabo places the district of Katakekaumene, or *Entirely-burnt*, 500 stadia in length and 400 stadia in breadth (xiii. 628, *Casaub.*). Strabo was in doubt whether it ought to be reckoned as part of Mysia or Mæonia. He describes the surface of the plain as covered with ashes, and the mountain rocks as of a black colour, as if they had been subject to the action of fire. (Compare *London Geog. Journal*, vol. viii., p. 142.) The vine was cultivated in this district with great success.

Thyateira (Θυατείρα), called at present *Akhissar*, was built by Seleucus Nicator; though there appears to have been a small town on the same spot before his time, called Pelopia. (Steph. Byz.; Pliny, *N. H.*, v. 29.) Strabo mentions it as a colony of the Macedonians (xiii. p. 929). It

[*] In the article ALYATTES the width is erroneously stated at 2600 feet,

was situate on the borders of Lydia and Mysia near the river Hyllus, on the road between Pergamus and Sardis. It was famous for the art of dyeing purple. (*Acts*, xvi. 14; and Kuinoel's note on the passage.) Thyatira, Philadelphia, and Sardis are three of the Seven Churches which are addressed in the Book of Revelations.

LYDIAN MODE. [Mode.]

LYDUS, JOANNES LAURENTIUS, was born at Philadelphia in Lydia (whence he derived his surname), about A.D. 490. At the age of twenty-one he repaired to Constantinople, and was employed for forty years at the court of the emperor in various official duties. He died about the latter end of Justinian's reign. Lydus appears to have been well acquainted with Greek and Roman antiquities; and his works, which are said to have been written after he had retired from the Imperial court, contain much curious information on the mythology and history of several of the nations of antiquity.

Three works of Lydus have come down to us: one 'On the Magistrates of the Roman Republic,' edited by Hase, Paris, 1812; a second, 'On the Months,' which was originally published by Schow, Leipzig, 1794, and has since been edited by Roether, Leipzig, 1827; and a third, 'On Omens and Prodigies,' which has also been published by Hase, with a facsimile of the MS. from which the edition has been printed. The best edition of Lydus is by Bekker, Bonn, 1837, which forms a part of the 'Corpus Scriptorum Historiæ Byzantinæ.'

LYE, EDWARD, born 1704, died 1767, an English clergyman, distinguished by the attention which he paid to the Saxon and Gothic languages and literature, was a native of Totness, educated in the university of Oxford, and beneficed in Northamptonshire. The living which he held was that of Houghton Parva, which he exchanged for that of Yardley Hastings. This appears to have been all the preferment he enjoyed.

The publications of Lye are all in that rare department of literature to which he especially devoted himself. The first was an edition of the manuscript left by Francis Junius [Junius], entitled 'Etymologicum Anglicanum.' This manuscript had long lain in the Bodleian Library, no one having the courage or the knowledge and leisure sufficient to undertake the publication of it, to the great regret of all scholars both at home and abroad. This Lye accomplished, and the work appeared, with some additions and suitable prolegomena, in a folio volume, 1743. He also published, at the desire of Berzelius, bishop of Upsal, an edition of that singular remain of the Gothic language, the parent of many dialects, the translation of the Evangelists, commonly called Ulphilas's version. During the whole course of his studies he had kept in view the preparation of a large dictionary of the Anglo-Saxon and Gothic languages. This great undertaking he had just completed, having actually delivered the manuscript to the printer, when death took him away. His labour however was not lost, the work being published in 1772, in two folio volumes.

There is a fuller account of this eminent person in Nichols's 'Literary Anecdotes of the Eighteenth Century,' vol. ix., p. 751-753, a work abounding in exact and original information concerning nearly all the distinguished literary labourers of the century to which it relates.

LYME REGIS is a small and irregularly built seaport town in the parish of Lyme and county of Dorset, 20 miles west from Dorchester and 120 west-south-west from London. The streets are badly paved and not at all lighted, and the principal thoroughfare is so narrow, that the safety of foot-passengers is said to be endangered. The fish-market, held in the best part of the town, is regarded as a nuisance, and the butchers' shambles are erected in the main street. Indeed the corporation appear for many years to have altogether disregarded the improvement of the town. The charters of incorporation granted to the town date from the 12th Edward I. to the 26th Charles II., which last was acted upon until 1688, when it was recalled by a proclamation of James II. The revenue of the corporation in 1833 was 288*l*., which was sufficient to cover its expenditure. This however is independent of the 'Cobb' or harbour dues, which amounted, in the year ending Sept. 30, 1833, to 417*l*., the disbursements on account of the same during that period being 446*l*. That the trade of the port is rapidly declining appears from the circumstance, that in 1831 the number of vessels which entered and cleared with cargoes inwards, outwards, and coastwise, was 629, the aggregate tonnage of which amounted to 44,930; while in 1833 the number of vessels was only 201, and the corresponding tonnage 11,877. Indeed the harbour appears chiefly valuable as a place of refuge for small vessels during bad weather, as it is the only safe shelter between Lyme Regis and the Start Point of Portland. The church, dedicated to St. Michael, is an antient edifice. The living, a vicarage in the diocese of Bristol and patronage of the prebendaries of the cathedral of Sarum, is valued at 275*l*. per annum. In 1831 the population of the parliamentary borough, comprehending the parishes of Lyme and Charmouth, was 3345, that of the town alone being 2407. Until the passing of the Reform Act Lyme Regis had returned two members to parliament continuously from the reign of Edward I. It now returns but one member. (*Report of the Commissioners on the Corporation of Lyme Regis*, from which this notice is chiefly drawn.)

LYMFIORD. [Jutland.]

LYMINGTON is a corporate town and parliamentary borough of Hampshire. The town is agreeably situated on the right bank of the river Lymington, at a short distance from its mouth, and is 7 miles south-west by south from Southampton, and about 90 miles south-west from London. It is well supplied with water, and the paving and lighting are defrayed by a rate of 13½*d*. in the pound on houses, and 4½*d*. in the pound on land. 'Lymington is subordinate to the port of Southampton, from the necessity of the importers having to pay the full duties on the entrance of their cargoes into the port' (*Corp. Reports*), which circumstance is regarded by the inhabitants as a grievance, inasmuch as they consider the situation of their own port peculiarly favorable to foreign trade. The foreign trade is unimportant, and the coasting-trade is evidently on the decline, for it appears that the aggregate tonnage inwards and outwards, which in 1812 amounted to 44,934, had gradually decreased down to the year 1832, when the tonnage inwards was 10,757, and outwards 7242. The town has of late years received considerable improvements, with a view to invite visitors during the bathing season: 3000*l*. had been subscribed in 1835 for the erection of baths, and a like sum for the establishment of gas-works. The chief manufacture of the neighbourhood is salt, which some years ago was carried on to a considerable extent, but has since declined. The salt-works are situated on the bank of the Solent Channel, to the south-west of the town. The fairs for cheese are held May 12 and October 2, and are usually well attended. Lymington is a borough by prescription, there being no charter extant or upon record. The town-council consist of four aldermen and twelve common-councillors (5 and 6 William IV., c. 76), and the income of the corporation, arising from landed property, tolls, quay and river dues, amounted, in the year ending October, 1832, to 68*l*. 19*s*. 5*d*., the expenditure during the same period being 79*l*. 12*s*. 4*d*. The parish church, dedicated to St. Thomas à Becket, is in the diocese of Winchester, and in its interior are many handsome monuments. The living is a curacy, dependent in some respects upon the church of Boldre, and the income is included in that of the vicarage of Boldre. The population of the town and parish in 1831 was 3361. Lymington has returned two members to parliament since the reign of Elizabeth. (*Boundary Reports*; *Corporation Reports*, &c.)

LYMNE'A. [Limneans.]

LYMNO'REA (Zoology), Peron's name for a genus of *Medusæ*. This name comes too near to *Limnoria*. See that article.

LYMNO'REA, a genus of fossil zoophyta, proposed by Lamouroux (*Expos.*, p. 79). Also the name of a genus of recent Medusidæ. (De Blainville, *Actinologie*, p. 290.)

LYMPH, LYMPHATICS. The Lymphatics are the system of vessels which, from the part that they take in the process of absorption, are not unfrequently called absorbents. They consist of minute branched tubes of extremely delicate membrane, whose extremities are arranged in a more or less dense net-work in every part of the body. From this net-work they gradually converge into a succession of branches of increasing size, and terminate in two main trunks, called the right and left great lymphatic veins, through which the lymph is poured with the chyle from the thoracic duct [Lacteals] into the right and left subclavian veins. The lymphatics also communicate with the veins at some other parts of their course, chiefly near their minute extremities, and more rarely by larger branches. They have in their interior numerous delicate valves formed of crescentic folds of the lining membrane, exactly like those of the veins [CIRCULATION, *fig.* 11], and, like them, preventing the retrograde course of the contained fluid. The valves of the lymphatics however are much more closely set than those of the veins, so that when full of fluid, the spaces between them being most distended, they give those vessels a knotted or beaded appearance, by which they are easily distinguished from veins of the same size. In the course of the larger lymphatics there are numerous firm roundish or oval bodies, called lymphatic or absorbent glands. [GLAND.] To each of these there pass two or more lymphatic vessels, which on entering them become extremely tortuous, and after varied convolutions and anastomoses, terminate in nearly the same number of branches, which again pass from the gland and pursue their course towards the main trunk.

The *Lymph* is a thin opaline whitish fluid of a somewhat saline taste, which a short time after it is removed from the body separates into a clear fluid and a soft white or pinkish coagulum. It is extremely difficult to obtain, in consequence of the small size of the lymphatic vessels; but in the rare cases in which a sufficient quantity has been procured for analysis, it has presented the same constituents as the blood deprived of its colouring globules. The coagulum consists of nearly pure fibrine, and the fluid portion is a solution of albumen with alkaline salts.

The physiology of the Lymphatics is explained in the article ABSORPTION.

The name of Lymph is rather vaguely applied to many different morbid secretions which have a thin watery appearance. Coagulating or coagulable Lymph is the fibrinous matter effused in the adhesive inflammation. [INFLAMMATION.]

LYNCEUS. [BRANCHIOPODA, vol. v., p. 342.]

LYNCHBURG. [VIRGINIA.]

LYNN, distinguished as **LYNN REGIS**, or **KING'S LYNN**, a parliamentary borough, port, and market-town in the hundred of Freebridge Lynn, in the county of Norfolk, is on the right or east bank of the river Ouse, a little above its outfal, in 52° 45′ N. lat. and 0° 25′ E. long., about 88 miles in a straight line north by east of St. Paul's, London, or 96 miles from Shoreditch Church by the road through Cambridge, Ely, and Downham Market.

The present town is supposed to have existed before the Conquest. It has been supposed that there was in the Roman time a town on the spot where the village of West or Old Lynn now stands, on the western side of the river. Before the time of Henry III. the Ouse is supposed to have had its outfal at or near Wisbeach (Wis-beach, or Ouse-beach), the Little Ouse, with the Nare, and one or two other streams, having their outlet at Lynn; but the old channel of the Ouse having become obstructed, a new channel was opened into the bed of the Little Ouse, and the waters of the Greater Ouse were thus brought by Lynn. The harbour of Lynn was considerably enlarged by this alteration, the western bank of the river being to a considerable extent swept away, with one of the churches of Old Lynn, and perhaps the site of the original or Roman town. (Richards's *Hist. of Lynn.*) Lynn had been, previously to this, a place of considerable trade, and was especially favoured by King John, who granted it a charter of incorporation. It was subsequently patronised by Henry VIII., who emancipated the corporation from the feudal superiority of the bishops of Norwich, and changed the name of the town from Lynn Episcopi, Bishop's Lynn, to Lynn Regis, or King's Lynn. In the civil wars of Charles I. the town stood out for the king, but capitulated A.D. 1643, after a siege of three weeks, to the earl of Manchester, the parliamentary commander for the eastern associated counties. A conspiracy was formed soon afterwards to surprise the parliamentary garrison, but it was detected, and the projector (the well-known Sir Roger L'Estrange) was kept for some years in prison.

The town at present extends in length about a mile on the east bank of the river, and about half a mile in breadth. It is traversed or bounded by several narrow streams or 'fleets,' over which are many bridges. There is no bridge in the town over the Ouse, which is about as wide as the Thames at London Bridge; but there are bridges about a mile above the town over the Eau Brink, which is a modern cut, and the old channel of the Ouse; by which bridges there is communication with West Lynn as well as with Wisbeach and the Lincolnshire Fens. The town was formerly defended on the land side by walls, in which were nine bastions and three gates. One of the gates on the south side of the town remains, and there are a few fragments of the walls: the fosse, which was outside the walls, still encircles the town. On the north side of the town is St. Ann's Fort, a battery of heavy guns, intended to guard the passage of the river. The town is well paved and lighted, but not well supplied with water. The three principal streets are parallel to the river; smaller streets connect them or branch from them. The houses are chiefly old and inconvenient, except in the more modern parts of the town. The Tuesday market-place, in the northern part of the town, comprises an area of three acres, and is surrounded by some good houses. There is in it a market-cross, an octagonal building, erected A.D. 1710, now in bad repair, having an Ionic peristyle rising to the first story, surmounted by an open gallery. The Saturday market is held in a convenient area near St. Margaret's Churchyard. There are also a cattle and a fish-market. The guildhall is an antient building of stone and flint, with court-rooms, assembly-rooms, &c. There is a borough gaol, but it is not sufficient for the proper classification of the prisoners. There are an exchange and a custom-house in one building, an excise-office, and a theatre, a modern building, well arranged and fitted up. The borough comprises the united parishes of St. Margaret and St. Nicholas, and the parish of All Saints in South Lynn. The church of St. Margaret is a cross church of spacious dimensions, which was once much larger. It contains portions of the early, decorated, and perpendicular styles of English architecture. The chancel or choir, which is early English, has a fine east window, and two octagonal turrets crowning the buttresses at the angles. There are two western towers, one of which formerly had a lofty spire, and there was formerly a lantern or tower at the intersection of the transept. The charnel-house, in the churchyard, was some years back used as a grammar-school, but a new school-house has been since built. The chapel of St. Nicholas is very large, being 194 feet long and 74 wide, inner dimensions. It consists of a lofty nave with side aisles, but without any transept or distinct choir: it is chiefly of decorated or perpendicular English architecture, with large east and west windows. It has a very rich south porch, and a fine wooden roof. It had a spire 170 feet high, which was blown down a century ago. All Saints' Church is also a cross church, but of smaller dimensions than St. Margaret: the tower, which fell down in 1763 and demolished part of the church, has not been rebuilt. Beside the churches there are the remains of some other ecclesiastical edifices. There is an hexagonal tower 90 feet high, a remain of the Grey (or Franciscan) Friars' monastery, which serves as a landmark to vessels entering the harbour. The chapel of our Lady on the Mount, or Red Mount Chapel, is on the east side of the town, and is remarkable for the beauty of its architecture: it is a small cross chapel of stone, and is erected on the walls of a more antient building of coarse red bricks, an irregular octagon, about 26 feet in diameter, with buttresses at the angles. St. James's Chapel was lately used as a workhouse. There are several dissenting meeting-houses in Lynn.

The population of the borough in 1831 was 13,370, of which a very small proportion was employed in agriculture or in manufacture properly so called. Rope and sailcloth are the only manufactures, and of the latter but little is made. The trade of the place is however great. It is the port of that large portion of the midland counties which is watered by the Ouse. The harbour is shallow, and the channel by which it is approached from Lynn Deeps is rather intricate. Some parts of this channel are not more than one foot deep at low-water in spring tides; and in following the channel from Lynn seawards, it is necessary to go at least five miles before reaching a depth of six feet. The banks on each side of the channel are then dry in some places to the height of ten or twelve feet. 'Lynn deeps' are the deeper parts of the channel out to sea, but they are ten or twelve miles below Lynn, following the course of the channel. (Commander Hewett's *Survey of Lynn and Boston Deeps.*) The exports are chiefly corn and agricultural produce, sent coastwise, and a fine white sand, found near the town, and used in making glass. A vast quantity of shrimps, caught on the shores of the Wash, are sent to London. The imports are corn and coal; timber from America; timber, deals, hemp, and tallow from the Baltic; wine from France, Spain, and Portugal, &c. Formerly many ships were fitted out for the Greenland whale-fishery, but this branch of industry has been in a great degree given up. Ship-building is not carried on to the extent it formerly was. There is a corn-market on Tuesday, and a market for general commodities on Saturday. There are two yearly fairs.

The corporation under the Municipal Reform Act consists of six aldermen and eighteen councillors, one of whom is chosen mayor: by the same act the borough was divided into three wards. Lynn has sent two members to parliament ever since 23rd Edward I. The parliamentary constituency in 1833 consisted of 257 freemen and 608 ten-pound householders; together 865. The parliamentary and municipal boundaries coincide, and include an area of 2620 acres.

The living of St. Margaret is a perpetual curacy united with the perpetual curacy of St. Nicholas; their joint yearly value is 138*l.* All Saints is a vicarage, of the clear yearly value of 134*l.*, with a glebe-house. Both are in the archdeaconry of Norfolk and diocese of Norwich.

There are at Lynn an endowed grammar-school, national and Lancasterian schools, and several private schools; a mechanics' institute, a parochial library in St. Margaret's Church, and a public subscription library. There are four hospitals or almshouses, and many other charitable institutions.

LYNX. The name of *Lynxes* is applied by zoologists to a subdivision of the great genus *Felis*, or Cats, well marked externally, and elevated by Mr. Gray to the rank of a genus, under the appellation of *Lyncus*.

There does not appear to be any considerable difference between the organization of the Lynxes and that of the other Cats; but it is extremely probable that there is some modification about the bones of the tongue, and the organ of the voice generally, to produce the peculiarly powerful noise analogous to what is called 'spitting' and 'swearing' in the domestic cat.

Linnæus, in his last edition of the *Systema Naturæ*, records but one species, *Felis Lynx*, to which he assigns the woods and deserts of Europe and Canada as localities. This was probably the *European Lynx*, and the descriptions may have been founded on Lynxes from Canada as well as Europe.

Gmelin, in his edition, adds three other species, *Feles Chaus*, *Caracal*, and *rufa*; and gives two varieties of *Felis Lynx*, with Europe, America, Northern Asia, and even Japan, as the habitations.

Pennant notices seven species of Lynxes,—the *Mountain Lynx*, Cat-a-mountain of Ray (North America), the *Serval*, the *Lynx*, the *Bay Lynx*, the *Caspian Lynx*, the *Persian Lynx*, and the *Libyan Lynx*. He states that the third inhabits the vast forests of the north of Europe, Asia, and America; 'not India, though poets have harnessed them to the chariot of Bacchus, in his conquest of that country.' The fourth, he says, is an inhabitant of the inner parts of the province (now the State) of New York. To the fifth he assigns the 'reeds and woods in the marshy parts that border on the western sides of the Caspian Sea, particularly about the Castle Kislar, on the river Terek,' and the Persian provinces of Ghilan and Mazanderan; adding that it is frequent about the mouth of the Kur, the antient Cyrus. Persia, India, and Barbary are the countries which he states to be the localites of the sixth; and Libya and Barbary are mentioned by him as the countries of the seventh. It is doubtful what animals Pennant meant to designate under some of these names. The *Serval* is not considered to be a *Lynx*.

Cuvier observes that there are known in commerce, under the name of *Loups Cerviers* (Lupus cervarius), four or five sorts of Lynxes, which had long been confounded by naturalists, and whose specific limits were not perhaps well fixed when he wrote. We shall proceed to notice the arrangement of M. Temminck, and then return to observe what part of it is adopted by the Baron.

M. Temminck gives the following as species:—

Felis cervaria; described as nearly equalling a wolf in size, and possibly the *Kattlo* of Linnæus and the Swedes; but it has been remarked that no skins of it are contained in the cargoes that arrive from the Baltic. In commerce the skins of *F. cervaria* are said to be only obtained from the markets of Moscow, to which they are brought from the provinces of Asia. It is considered as probable that this species may have been confounded, under the name of the *Canadian Lynx*, with

2. *F. Borealis*, which is intermediate in size between the fox and the wolf. This comprehends the *Canadian* but not the *Mississippi Lynx* of Cuvier, and is said to inhabit the north of both the old and the new continents: its fur, less valuable than that of *F. cervaria*, is stated to be received equally from Sweden and from Hudson's Bay.

3. *F. Lynx* (true Lynx), different from, but nearly allied to, *F. cervaria*, *F. Borealis*, *F. rufa*, and

4. *F. pardina*. Size of a badger, but the legs longer, resembling *F. rufa* in form and size; tail short, but longer in proportion than that of *F. Lynx*. *F. pardina* is the *Loup Cervier* of Perrault, and is found only in the south of Europe, the centre being the locality of the true *Lynx*.[*]

5. *F. Caracal*; *Nubian Caracal*; and *Cat of the Desert* of Bruce; *Persian Cat* (*Lynx*) of Pennant.

6. *F. aurata*. Rather less than the Caracal. Country unknown. Skin purchased from a London dealer.

7. *F. Chaus* (Güldenstedt), figured by Schreber. The other animals described under this name are considered to be referrible to

8. *F. Caligata; Booted Lynx* of Bruce; *F. Libycus* (Olivier); *Libyan Caracal* of Buffon.

Of these Baron Cuvier notices *Felis cervaria* as the finest and largest; *Felis Borealis; Felis Lynx*, which has almost entirely disappeared from populous countries, but is still to be found in the Pyrenees, the mountains of the kingdom of Naples, and even, it is said, in Africa; *Felis pardina*, Oken, from the south of Europe; *Felis rufa*, Gülden.; and *Felis Chaus*, or *Lynx of the Marshes* of Caucasus, Persia and Egypt. Cuvier further observes that it is believed at present that the *Booted Lynx*, *Felis caligata*, Temm., may be distinguished from *Felis Chaus;* but he remarks that *F. caligata* is at least very nearly approximated to it, and that it has the same habits.

Felis Caracal (Persia, Turkey, &c.), which he considers to be the true Lynx of the antients, closes Cuvier's list of species; but he alludes in a note to *Lynx fasciatus*, *L. Floridanus*, and *L. montanus* of Rafinesque; and to *Felis aurata* of Temminck, as belonging to this tribe.

Mr. Gray places his genus *Lyncus* (subfamily *Felina*) between the genera *Felis*, Linn., and *Prionodon*, Horsf.

M. Lesson gives the following species:—1. *F. Lynx*, the '*Loup cervier* of the furriers, *Goupe* of the Norwegians, and *Wargelue* of the Swedes, who recognise three very different varieties of it.' He states that the whole of Europe is its habitat, where it has become very rare, and he says that they point out (' on indique') a pale variety, '*Felis rufa*, Pennant?' and that ' le capitaine Brooks en indique trois,' which may be, in his (the captain's) opinion, regarded as species. 2. *F. pardina*, Oken, Temm.; *Loup cervier* of the French Academicians; to this Portugal, Sardinia, Sicily and Turkey are assigned as localities. Next follows *Felis Serval*, which cannot be considered a Lynx. 3. *F. cervaria*, Temm. 4. *Felis Borealis* (Chat du Canada, Geoff.), to which the northern countries of America and Asia are given as its distribution. 5. *Felis Caracal*, the *Lynx* of the antients (Africa, Persia, and Arabia). M. Lesson describes the differences of the Caracals of Algiers, of Nubia, and of Bengal. 4. *F. Chrysothrix* and *F. aurata*, Temm.; country unknown. 5. *F. Chaus*, Gülden. (Egypt, Nubia, and Caucasus). 6. *Booted Lynx* (*F. caligata*, Bruce, Temm.; *F. Libycus*, Oliv.). To this a range is given from Egypt to the Cape of Good Hope in Africa, and the south of Asia. M. Lesson also notices as specifically different the *Felis Manul* of Pallas and Desmarest, a species not admitted by Temminck, but which has, according to Pallas, the appearance of the *Lynx*. (Mongolian Tartary.)

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[*] With respect to *Felis Pardina*, Col. Sykes makes the following statement: 'Although Temminck, in his "Monographie de Mammalogie," p. 116, in a note, says the skin of this European *Felis* is well known amongst the furriers as the Lynx of Portugal, I have nowhere been able to meet with a specimen in London; and as amongst my friends scarcely any one appeared to be aware of the existence of a Spanish Lynx, I thought it might be acceptable to the members to exhibit specimens in a state of maturity and nonage. In Andalusia, whence the specimens come, it is called *Gato clavo* (*clavo* meaning the pupil of the eye), illustrative of the spotted character of the skin. Some peasants in Andalusia make short jackets of the skins. The animal inhabits the Sierra Morena. I bought both skins at Seville for thirty reales, about 6*s.* 3*d.* Neither the British Museum nor the Zoological Society has specimens.

'Temminck describes the *Pardina* as "Toutes les parties du corps *lustre*, à peu près de la même teinte que dans le caracal." This is certainly not the description of my animal, the colour of the adult being reddish-gray, and that of the non-adult light fawn; nevertheless there are so many other points common to both, that it would be unadvisable to consider them distinct.' (*Zool. Proc.*, 1838.

Sir William Jardine ('Naturalist's Library,' Mammalia, vol. ii., 1834), who adopts the genus *Lyncus* or *Lynchus* of Mr. Gray, as the fifth genus of the *Felinæ*, enumerates the following species: *Lynchus Caracal; L. aurata; L. Chelidogaster*, inhabits Chili (Temm., Mus. Leyd.); *L. caligata*, Bruce; *L. nigripes*, Burchell, inhabits South Africa; *L. Chaus* (Gülden., Rüpp.); *L. Canadensis; L. rufa*, Bay Lynx, inhabits banks of Colombia river, United States, not Canada (Temm.); *L. fasciata*, Banded Lynx (Richardson), inhabits N. America, woody countries in the neighbourhood of the Pacific (Lewis and Clark); and *L. Lynx*.[*]

Sir William Jardine remarks that there is yet considerable confusion among the Lynxes of America, and that, except the Canada Lynx, the species are perhaps not well determined. He observes that Mr. Vigors and Dr. Horsfield describe one under the title of *F. maculata* from Mexico.

Sir William further states that another Asiatic Lynx may be perhaps added in the *Felis affinis* of Mr. Gray, figured in his 'Illustr. of Indian Zoology.'

It may be necessary also to call the reader's attention to two species of *Felis*, one in the volume of the 'Naturalist's Library,' *F. Servalina*, figured as *F. ornata*, which Sir W. Jardine at first considered as identical with Mr. Gray's species with the last-mentioned name, but which Mr. Gray considered to be distinct. The figures of both *F. ornata*, Gray ('Illustr. Ind. Zool.'), and *F. servalina*, Jardine, have small tufts on the tips of their ears, and are otherwise inclined to be lynx-like; as if they formed the passage between some of the smaller Spotted Cats and the Lynxes.

Mr. Swainson ('Natural Hist. and Classification of Quadrupeds,' 1835) having compared the two typical forms of the *Feræ* and *Raptores*, observes that it remains to be ascertained which group among the *Feræ* may be likened to the *Owls*, and he fixes upon the *Lynxes*, because *Lynxes* and *Owls* are both nocturnal animals, both have short tails and comparatively large heads; and because the *Owls* 'are particularly remarkable for certain appendages or tufts which rise above their ears,' whilst in the *Lynxes* the 'ears are long, and from the tip of each arises a tuft of lengthened hairs, perfectly analogous to the tufts of lengthened feathers on the horned *Owls*, the most typical birds of the family of *Strigidæ*.' His only notice of *Lynx* in the 'Classification' at the end of the volume is '*Lynx* Antiq., ears tufted with hairs, tail short;' and it appears as the fifth and last subgenus of *Felis*, Linn., the other four being,—1. 'Leo Antiquorum, *Lions*, head and neck furnished with a mane of long hair, tail tufted. 2. *Felis, L. Cats*, no main, tail long, not tufted. 3. Cynailurus, Wag., *Hunting Leopards*, claws semi-retractile; and, 4. Prionodon, Horsf., affinities uncertain.'

The *Lynxes* may be divided into two groups: the first consisting of those species whose bodies are comparatively slender, and whose tails and tufted ears are comparatively long; the second of those whose bodies are thicker and stout, and whose ears and tail are comparatively short. The *Caracal* is an example of the first subdivision; and the *European* and the *Canada* Lynxes of the second. Sir Wm. Jardine considers the tufts of hair at the tips of the ears as somewhat inconstant, and only present in spring, or at the commencement of the breeding season, like those adorning the ears of many squirrels.

It is evident that much doubt still hangs about many of the species, and we shall endeavour to lay before the reader some of those forms which are most free from uncertainty.

LYNXES OF THE OLD CONTINENT.

As examples of the Lynxes of the Old World we select the following species:—

The Caracal. M. Temminck describes this species (*Felis Caracal*), which is the *Siyah Ghush* or *Black-ear* of Charleton and others, as having a pale reddish-brown fur with a vinous tinge, the red becoming paler as it reaches the lower parts. Two spots of pure white above the eyes, the uppermost on the inner side of the eye, the lower at its external angle. Termination and edges of the upper lip, chin, breast, belly, and insides of the legs pure white; parts whence the whiskers spring, black; back of the ears at the base, deep black, more grey towards the tips, which are tufted with long black hairs. Length, 2 feet 10 inches, of which the tail measures 10: average height about 14 inches.

Mr. Bennett (*Tower Menagerie*) describes the Caracal as larger than the Fox, and the whole of the upper surface of the body as of a deep and uniform brown, the hairs being for the most part slightly tipped with grey; the under and inner parts nearly white; and the chin, lower lip, and two spots, one on the inner side of and above the eye, and the other beneath its outer angle, completely white; neck and throat of a lighter and brighter brown than the rest of the fur; the ears long and upright, tapering gradually to a fine tip, surmounted by a pencil of long black hairs, and black externally and whitish within; whiskers short, taking their origin from a series of black lines which occupy the sides of the muzzle; at some distance behind them, in front of the neck on each side, a short and thick tuft of lighter coloured hairs; tail eight or nine inches long, of the same uniform colour with the body from base to tip.

The description of Mr. Bennett is very good, and so is that of M. Temminck. Slight variations of colour as to the hue depend most probably on sex, age, and locality. There are three or four specimens now living in the Garden of the Zoological Society of London (Regent's Park). The finest of these, now in very fine condition, was brought over with the Giraffes.

Geographical Distribution.—Persia, India, Barbary (Pennant); Persia, Turkey, &c. (Cuvier); the whole of Africa from Egypt and Barbary to the extremity of Caffraria, and the southern half of Asia, at least as far eastward as the Ganges (Bennett). N.B., the specimen from which Mr. Bennett took his description is noticed by him as a native of Bengal, and he observes that there is no difference of any importance between it and the African variety [illegible] Cuvier, to whom M. Duvaucel sent drawings of the animal from Calcutta, was convinced that this is the case. He refers to the *Caracal à longue queue* of Buffon's Supplement, iii., pl. [illegible], and observes there is no difference between that and the others, and that the first Caracal of Buffon had a mutilated tail. Africa, Arabia, Persia (Fischer); Africa, Persia, Arabia (Lesson); Southern India and Africa (Jardine).

Habits, Food, &c.—This species is said to follow the lion and other large beasts of prey, most probably for the purpose of feeding upon what they leave. But in addition to this it feeds on small quadrupeds and birds, the latter [illegible] which it is said to pursue actively on trees. It has obtained the name of lion's provider, most probably from its dogging the footsteps of the lion and having been found [illegible] upon the carcasses which the former has left. According [illegible] M. Temminck, the Caracals hunt in packs like [illegible] dogs, and so run down their prey. Pennant [illegible] Thévénot, notices their feeding on the remains of [illegible] which the lion leaves, and seems to confirm the [illegible] given by M. Temminck, for he states that they [illegible] brought up tame, and used in the chace of [illegible] drupeds and the larger sorts of birds, such as [illegible] pelicans, peacocks, &c.: when they seize their [illegible] hold it fast with their mouth and lie motionless on [illegible] nant, quoting Hyde, also states that the Arabians [illegible] who call it *Anak el Ard*, say that it hunts like the [illegible] jumps up at cranes as they fly, and covers its [illegible] hunting. In captivity the Caracal is generally [illegible] natured and irritable, and does not seem to hold [illegible] promise for domestication; but we are aware that [illegible] it is safe to come to conclusions of this sort upon the evidence of an unhappy irritable animal shut up in a cage, when nature intended it for unlimited roamings. Since the above was written, we have seen a young Caracal in the Garden of the Zoological Society at the Regent's Park that might be rendered very tame with a little attention: it is already familiar, anxious to be noticed, pleased with being caressed, and playful as a kitten. Dr. Charleton however gives evidence of the fierceness and strength of this species, for he relates that he saw one fall on a hound, which it killed and tore to pieces in a moment, though the dog defended itself to the utmost.

This animal derives its name of *Caracal* from the Turkish words *kara*, black, and *kulach*, ear; and the Persian name *Siyah Gush* or *Sia-gusch* (*sia*, black, and *gusch*, ear) is derived from the same characteristic markings.

Authors seem to concur in holding that this is the Λύγξ,

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[*] In the article LION, vol. xiv., p. 36, in the enumeration of the species of Puma adopted by Sir William Jardine, the word 'Pajeros' has been interpolated between 'P.' and 'chalybeata,' and 'P. Yaguarundi' is omitted. The correct list, as given by Sir William, is, 'P. concolor, P. nigra, P. Yaguarundi, P. Eyra, P. Pajeros, P.? chalybeata.' Figures of Felis Yagouarondi and Felis Pajeros are given in 'The Zoology of the Voyage of H.M.S. Beagle,' edited by Mr. Darwin and published with the approval of the Lords Commissioners of the Treasury, now in course of publication.

Lynx, of the antients, and though we lean strongly to this opinion, the reader should bear in mind that the latter evidently used the term to denote various animals, as Gesner well remarked. The 'lynces Bacchi variæ' of Virgil (*Georg.*, iii. 264) and the skin 'maculosæ lyncis,'[*] alluded to by the same author (*Æneid.*, i. 323), can hardly be held to apply to the *Caracal*, though Ovid's line (*Met.*, xv. 413)

> 'Victa racemifero lyncas dedit India Baccho'

may. The truth seems to be that the antients themselves had no very precise ideas of the animal which was accorded to Bacchus as one of his attributes. The terms Lynx, Panther, and Tiger seem to be all employed to designate this animal or these animals; and if we refer to gems or coins or other antient monuments, the *Lynces*, to play somewhat unpardonably perhaps on Virgil's expression, will be found to be sufficiently *variæ*. The animals represented on the antient sculptures have generally the round ear of the Lion, Tiger, and Panther or Leopard; and their general contour is that of the Lion, Lioness, or Panther, and Leopard. See, for instance, No. 30, No. 37, in Room 1; Fragments of Terracottas in Room x.; No. 8 (Bacchus and Ampelus), Room iv.; No. 40 (Libera, or Female Bacchus), Room vi.; No. 12, Room iii.; and No. 7, Room ii., of the Townley Gallery in the British Museum; and the publication by the Society for the Diffusion of Useful Knowledge, 'British Museum: Townley Gallery,' vol. i. and ii. The Lion's skin, with which, as well as that of the Panther and Roe, he was represented, appears on the colossal statue of Bacchus in the Elgin collection in the British Museum.[†] In the edition of the *Gemmæ et Sculpturæ Antiquæ*, by Gronovius, we find in the 'Carro di Baccho,' lluded to in the article LEOPARDS, a child in a chariot driving two round-eared spotted great cats: and, in the next gem figured, 'Tigre di Bacho,' also a cornelian, we have a round-eared spotless female great cat with a tuft at the end of the tail, which no Panther, Leopard, or Lynx possesses.

In the coin of Septimius Severus, noticed in Captain Smyth's 'Catalogue,' between the figures[‡] is a Lynx or Panther, illustrating the verse of Propertius:—

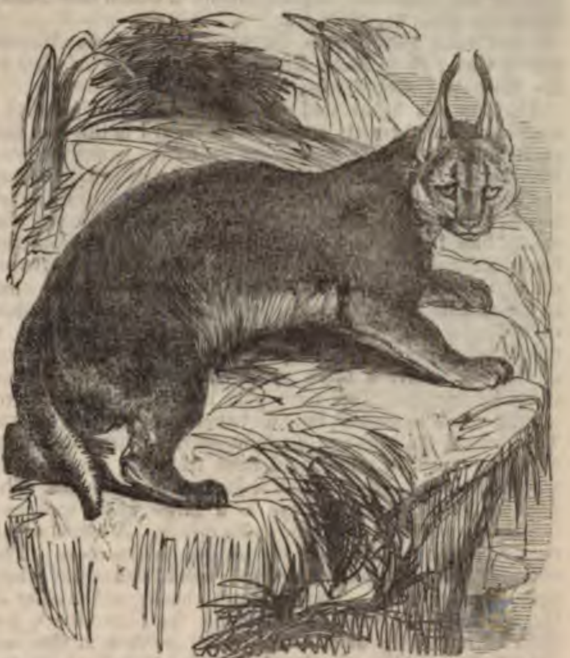
> 'Lyncibus ad cœlum vecta Ariadne tuis.'

Nor does there occur to us any antient statue, gem, or coin whereon the 'Lynx' of Bacchus is represented with pointed ears tufted at the summit, the characteristic mark of that subdivision of the cats denominated *Lynxes* by modern zoologists; though we by no means feel sufficient reliance upon our limited experience to consider this negative evidence as conclusive. The animal in the Palestrine Mosaic, with the word 'Lynx' below it, is represented with a tail of considerable length, and cannot be mistaken for one of the animals now called Lynxes; indeed, if we do not err, the Abbé Barthélemi observes that this animal bears a strong resemblance to a horse.

That the Λύγξ of Aristotle, Ælian, and Oppian was not one of the doubtful animals above alluded to, but one of the Lynxes of modern zoologists, there can be, in our opinion, no doubt.

Ælian (xiv. 6) gives such a description of his Lynxes, with the tips of their ears tufted, their leaping on their prey, and their tenacity in holding it, as cannot be mistaken; and he quotes two lines of Euripides, to show that the animal which he is describing is the Lynx of that poet. Oppian *Cyneget.*, iii., v. 84) also gives such an account of his Lynxes as can be referrible to no other animals than those on which we are treating. He speaks of two kinds, notices heir preying on hares, and leaping upon stags and oryxes.

Pennant conceived that the European Lynx was the Λύγξ of Ælian and Oppian, and the *Chaus* of Pliny; with regard to the former, we think, without due consideration. The *Caracal* comes much more within Oppian's description than the European Lynx. Oppian expressly notices the ruddy and the yellow colours of his two kinds, but mentions no spots. The localities of the *Caracal*, combined with the other evidence, make it much more probable that it should be the animal designated as a Λύγξ by Aristotle and Ælian, and one, at least, of the two kinds mentioned by Oppian, if his differences were not, as they well might be, those of climate, sex, or age. Mr. Bennett ('Tower Menagerie') thinks that the *Caracal* is unquestionably identical with the 'Lynx' of the antients, though the name has been usurped in modern times for an animal of northern origin, utterly unknown to the Greeks, and known to the Romans by a totally different appellation.


The Caracal.

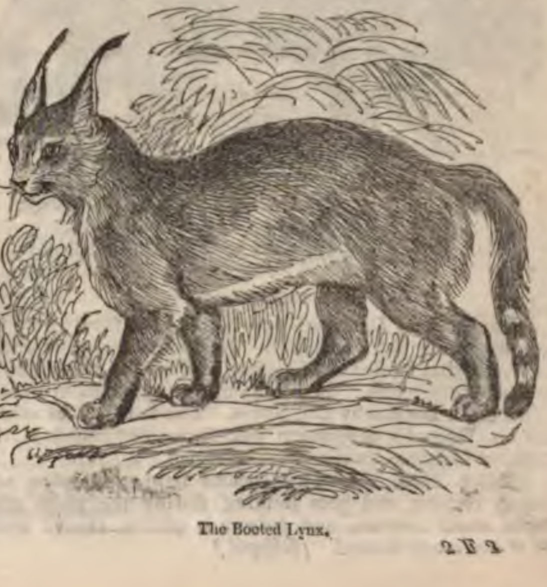
The Booted Lynx, *Felis caligata*, Bruce, Temm.; *F. Libycus*, Olivier; *F. Chaus*, Thunb., Geoff. (part); *Lynx des Marais* (part), Cuv. (Fischer).

Description.—Small, total length about three feet, of which the slender tail measures rather more than one-third, or thirteen inches and a half; ears large, red within, tipped with a pencil of brown short hairs; sole and posterior part of the foot (leg, in common parlance) deep black; upper parts of the body bluish grey, in some specimens fulvous, clouded with grey and sprinkled with black hairs; lower parts, including the under parts of the neck and breast, reddish; thighs marked with indistinct bands of rather bright brown; two rather bright ruddy bands on the cheeks; tail at its base colour of the back, black at the tip, and with three or four incomplete rings above it, which rings are separated by intervals of a more or less pure white.

The *Female* has, generally, the tints more yellow.

The *Young* have well-defined dark bands upon their sides.

Geographical Distribution.—Africa, from Egypt and Barbary to the Cape of Good Hope; the south of India.


The Booted Lynx.

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[*] 'Succinctam pharetrâ et maculosæ tegmine lyncis.'

[†] See 'Library of Entertaining Knowledge:—British Museum—Elgin and Phigaleian Marbles,' vol. ii.

Hercules and Bacchus.

Food, Habits, &c.—The *Booted Lynx* preys upon birds and small quadrupeds; of the former the Guinea-fowl is much sought after by the African varieties. Like others of the subdivision, it will make a good meal on carrion, and feast on the remains of larger quadrupeds which have fallen before the great beasts of prey.

The Chaus, Felis Chaus, Güldenst.; *Lynx des Marais* (part), Cuv.; *Mota Rahn Manjur*, or *Larger Wild Cat*, of the Mahrattas (Col. Sykes).

Dr. Rüppel's figure and description have dissipated the confusion that formerly reigned with regard to this and the preceding species. He states that the *Chaus* is well covered with hair all over, and of this covering that which forms the ground-work is woolly, very soft, and plentifully developed; the hairs are not thickly set. The colour of the woolly hair is of a dirty palish ochre-yellow, darker on the back and lighter on the under parts; the hairs or bristles are of the same colour at bottom, have a dark-brown ring in the middle, and at the tip are of a greyish yellow, whitish, or saffron-colour; so that the appearance produced is a mixed colouring of greyish yellow and dirty white. Many of the hairs have a black point, and on the sides, where many lie together, they form pale black perpendicular or oblique spiral lines, and here and there single black points. The hairs of the back are of a light ochre-yellow, with points almost of a saffron colour, and form from the shoulders to the tail a yellow stripe, which is darkest on the cross. The nose is black; above the eye is a large white spot, and below it a smaller one of the same colour. A black streak runs from the inner corner of the eye to the nose. The edges of the lips are bordered with black, and a fine white ring encircles them. The eyebrows, cheeks, and bristles of the whiskers are white, and among the latter are a few hairs of a shining black. The inner surface of the ear, towards its outside, is bordered by tufts of hair which are white and yellow; the back of the ear is grey brown, and the tips are brown with terminating black tufts, half an inch in length; the cheeks, lower jaw, throat, neck, and chest are ochreous yellow, and the belly inclines to whitish yellow with darker spots. Externally the anterior and posterior extremities are of the general colour down to the ankles (which are dirty ochreous yellow and black behind), and barred with four or more black transverse bands. The inside of the limbs is yellowish, and there is a large round black spot on the fore-legs. The tail is about one-fourth as long as the body, of a greyish colour, blunt and black at the point, towards which are two black rings between two greyish white ones; but neither of these is very distinct. (Rüppel.)

The Chaus (Rüppel).

Geographical Distribution.—North of Africa; how far up the Nile is not ascertained. In the morasses and bushy lowlands that border the Caspian Sea, and on the banks of its tributary rivers. Said to be more numerous in Persia. Noticed in Deccan by Col. Sykes. The female that served for Dr. Rüppel's description and figure was killed at the Lake of Menzale, in the Delta of Egypt.

Habits, Food, &c.—This species haunts marshes and boggy regions, and goes hunting during the night after *birds, small rodents*, and fishes; it seldom climbs trees, *and is not easily tamed.* (*Rüppel.*)

The *Chaus* of Pliny (*Nat. Hist.*, viii. 19), which the Gauls called Raphius, with the figure of a wolf and the spots of a pard, first shown at Pompey's games, can hardly, we think, have been this animal.

EUROPEAN LYNXES.

The European Lynx. Felis Lynx, Linn.; *Le Lynx*, Buff.—Fur long, of a dull reddish grey above, with oblong spots of reddish grey upon the sides, the spots on the limbs rounder and smaller; whitish below, mottled with black. Length about three feet.

This species varies much. In winter the fur is much longer than it is in the summer, and has a hoary appearance in the former season, owing to the long hair being then tipped with greyish white. The tail, which is black at the end, is short, not more than six or seven inches long.

Geographical Distribution.—Some authors confine the locality of this species to Europe; others are of opinion that it increases in numbers as it approaches the borders of Asia, which it also inhabits, and abundantly. France is considered its most northern range. It does not seem to be quite clear that *Felis cervaria* of Temminck is not a variety of this species. But *F. cervaria* inhabits the north of Asia, and skins are sent from Moscow. This is supposed to be the *Kattlo* of the Swedes by some, while others consider *F. Lynx* to be the *Goupe* of the Norwegians and the *Wargelue* of the Swedes. If these differences should prove to be well founded, it may be that there are two European species, or at least varieties, one inhabiting southern Europe not higher than France and the warm parts of Asia, and the other inhabiting the north of Europe and Asia.

Habits, Food, &c.—The European Lynx feeds upon small quadrupeds and birds, in search of which it often climbs trees.

This species is supposed by many to be the *Lupus cervarius* of Pliny (*Nat. Hist.*, viii. 22) and the *Chaus* (viii. 19) above alluded to. Both are spoken of as shown in the arena by Pompey, and as coming from Gaul. Dr. Fischer, who is of this opinion, supposes it also to be the *Lynx* mentioned by Pliny in his chapter 'De Ungulis' (viii. 46).

European Lynx.

The European and northern Asiatic Lynxes and the Canadian Lynx produce the great supply of furs known by the furriers under the name of lynx. The colder the climate the fuller and the more valuable is the fur.

AMERICAN LYNXES.

We select as our example the

Canada Lynx, *Felis Canadensis* (Geoff.). Dr. Richardson ('Fauna Boreali Americana') states that the early French writers on Canada, who ascribed to this species the habit of dropping from trees on the backs of deer, and destroying them by tearing their throats and drinking their blood, gave it the name of *Loup Cervier*. The French Canadians, he adds, now term it indifferently *Le Chat*, or *Le Peeshoo*. He remarks that the mistake of Charlevoix in applying to it the appellation of Carcajou, which is proper to the wolverene, has produced some confusion of synonymes amongst subsequent writers. Other writers however consider that Charlevoix intended to designate the Puma by the name of Carcajou, though he used the term improperly. If the following be the passage alluded to, it can hardly be applied to the Canadian Lynx—'The elk has other enemies besides the Indians, and who carry on full as cruel a war against him. The most terrible of all these is the Carcajou, or Quincajou, a kind of cat with a tail so long that he twists it several times round its body, and with a skin of a brownish red. As soon as this hunter comes up with the elk he leaps upon him, and fastens upon his neck, about which he twists his long tail, and then cuts his jugular,' &c. &c. (*Letter* vii.) Now though there may be a little exaggeration about the length of the tail, and the use which the animal makes of it, the description is generally applicable to the Puma. and not to the Lynx, which has a mere stump of a tail, whilst the Puma has a remarkably long one. [GULO; LIONS, vol. xiv., p. 36.]

Description.—As there is some question about this species—for Pennant notices it as identical with the European Lynx, and M. Temminck describes the species as the same in both hemispheres, under the name of Felis Borealis, whilst M. Geoffroy has named it as a distinct species—we shall give the description of Dr. Richardson, who adopts M. Geoffroy's name, at length.

'The *head* is round, the nose obtuse, and the face has much of the form of that of the domestic cat, but the facial line is more convex between the eyes. The *ears* are erect, triangular, and tipped by an upright slender tuft of coarse black hairs; they are placed about their own breadth apart, and on their posterior surface they have a dark mark beneath the tip, which is continued near both margins downwards towards their bases. On the *body* and *extremities* the fur is hoary, most of the hairs being tipped with white; on the crown of the head and for a broad space down the middle of the back there is a considerable mixture of blackish brown, and on the sides and legs of pale wood-brown. In some specimens these colours produce an indistinct mottling, but in general there are no defined markings. A rufous tinge is also occasionally present about the nape of the neck, and on the posterior parts of the thigh. The *tail* is coloured like the back, except the tip, which is black. The *fur* is close and fine on the back, longer and paler on the belly. When blown aside it shows on the middle of the back a dark liver-brown colour from the roots to near the tip, but on the sides it is for the greatest part of its length of a pale yellowish-brown, being merely a little darker near the roots. The *legs* are thick, the toes very thick and furry, and are armed with very sharp awl-shaped white claws, shorter than the fur. There are four toes on each foot, those on the hind foot being rather the largest, but both feet have much spread. Length three feet one inch,' &c.

Dr. Richardson gives the following synonymes, &c.:—*Loup cervier* (Anarisqua) Sagard. Theodat.; *Loup-cervier*, or *Lynx*, Dobbs; *Cat-Lynx*, Penn., 'Arct. Zool.;' *Cat*, or *Pishu*, Hutchins; *Lynx*, or *Wild Cat*, Hearne, Mackenzie; *Felis Canadensis*, Geoff., 'Ann. du Mus.,' Sabine, Franklin's 'Journ.'; 'Zoological Museum,' No. 72; *Peeshao*, Cree Indians and Canadian Voyagers.

Geographical Range.—The only species of the genus existing north of the Great Lakes, and eastward of the Rocky Mountains. Rare on the sea-coast; does not frequent the Barren Grounds, but is not uncommon in the woody districts of the interior. Found on the Mackenzie River as far north as 66°. (Richardson.)

Habits, Food, &c.—Timid, incapable of attacking any of the larger quadrupeds, but well armed for the capture of the American hare, its principal prey. 'Its large paws, slender loins, and long but thick hind legs, with large buttocks, scarcely relieved by a short thick tail, give it an awkward clumsy appearance. It makes a poor fight when it is surprised by a hunter in a tree; for though it spits like a cat and sets its hair up, it is easily destroyed by a blow on the back with a slender stick, and it never attacks a man. Its gait is by bounds, straight forward, with the back a little arched, and lighting on all the feet at once. It swims well, and will cross the arm of a lake two miles wide;* but it is not swift on land. It breeds once a year, and has two young at a time.' (Richardson.)

Utility to Man.—The skin of the Canada Lynx forms a considerable article in the fur trade; the annual importation by the Hudson's Bay Company is stated at from seven to nine thousand. Dr. Richardson says that the natives eat its flesh, which is white and tender, but rather flavourless, much resembling that of the American hare.

The Canada Lynx.

Those who would wish to read of the fabulous qualities gravely attributed to the quick-sighted lynxes, and the use of some of their parts in the antient 'Pharmacopœia,' may consult Pliny, *Nat. Hist.*, viii. 38; xxviii. 8; and Ovid, *Met.*, xv. 413. See also the article BELEMNITE.

LYNX, a constellation of Hevelius, situated directly in front of Ursa Major, the head of the animal being half way between α Ursæ Majoris and Capella. Its principal stars are as follows:—

Character.	No. in Catalogue of		Magnitude.
	Flamsteed. (Piazzi.)	Astron. Society.	
a	1	770	5½
b	2	776	4
e	15	847	5
k	27	987	5
m	31	1014	5
p	38	1125	4
r	40	1131	4
	(245)	1103	5

LYON, or **LION**, a city in France, formerly the capital of the district of Lyonais, now of the department of Rhône, situated at the confluence of the Rhône and the Saône, in 45° 46′ N. lat., and 4° 50′ E. long.; 240 miles in a direct line south-east of Paris; 286 miles by the road through Sens, Auxerre, Autun, and Châlons sur Saône; 288 through Fontainebleau, Nevers, Moulins, and Roanne; and 303 by Troyes, Dijon, and Châlons sur Saône.

The common opinion is that Lyon was founded by L. Munatius Plancus, commander of the legions in Gaul at the time of Julius Cæsar's death, who settled here the people of Vienna (Vienne), who had been driven from their own home by a revolt of the Allobroges, about 42 B.C. It seems improbable however that a situation so advantageous should have been entirely neglected by the Gauls; and the Celtic name given to the place, Lugudunum or Lugdunum (a name common to two other towns, Lugdunum Batavorum, now Leyden, and Lugdunum Convenarum, now St.

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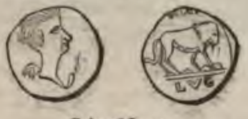
* In reference to the allegation that Charlevoix refers to this animal when he uses the term Carcajou, we may remark that in the continuation of his account he describes the Elk as fleeing to the water the moment he is seized; for 'the Carcajou, who cannot endure the water, quits his hold immediately, but if the water happen to be at too great a distance, he will destroy the elk before he reaches it.'

Bertrand de Comminges), prevents our ascribing its origin wholly to Plancus.

Cæsar does not mention Lugdunum, which has furnished one of the reasons for denying to the town any higher antiquity than the time of Plancus; but the reason seems altogether insufficient.

Almost thirty years after the settlement of the Viennese, Plancus established at Lugdunum a Roman colony, or rather a municipium; such at least is the opinion of Father Menestrier, the Jesuit, in his erudite history of Lyon· others make the settlement of the Viennese and of the Roman colony to have been simultaneous.

Augustus was in Gaul about the time when Plancus is supposed to have established his colony, and appears to have made Lugdunum his place of residence for some time, an indication of the rising importance of the place. Strabo, writing a few years after, describes it as the most populous city of Gaul, except Narbonne (iv. 192, *Casaub.*). It was the great mart of the Romans, who had, even at that early time, a mint for coining gold and silver money, and it gave name to one of the four great divisions of Gaul. An altar was erected here by sixty of the nations of Gaul, by common consent, in honour of Augustus.



Coin of Lyon.

British Museum. Actual size. Silver.

Both Tiberius and Caligula appear to have favoured the town. The latter visited it, and instituted games professedly in honour of Augustus, about A.D. 40. The emperor Claudius, himself a native of Lyon, raised it from the rank of a municipium to that of a colony, in the strictest sense of the term, and regulated its local government. But its greatness received soon after a terrible blow; it was utterly destroyed in a single night by fire, originating, it has been conjectured, from lightning, about A.D. 59, according to some, but according to other calculations, about A.D. 64 or 65. The rebuilding of the city was promoted by a grant from the emperor Nero, to whom the citizens manifested their affection and fidelity in his downfal. Upon Vitellius assuming the imperial purple, they embraced his cause; and he stayed some time at Lugdunum on his way from the Rhenish provinces to Rome. Domitian, afterwards emperor, came to this city on the overthrow of Vitellius, to establish the authority of his father Vespasian in Gaul.

In the contest of Clodius Albinus with Septimius Severus Lugdunum became the scene of contest. In an engagement near this town Albinus was totally defeated and slain (A.D. 197). Lugdunum, which had afforded a retreat to the vanquished, was pillaged by the victor, who put most of the inhabitants to the sword, and burned the town, which Herodian describes as being then large and wealthy. In the reign of Probus, Proculus was elected emperor by the people of Lugdunum, who had been ill-treated by Aurelian, and were fearful of the severity of Probus. The latter however defeated Proculus, and caused him to be put to death (A.D. 280).

The usurper Magnentius, having been defeated by Constantius, sole survivor of the sons of Constantine, took refuge in Lugdunum, but was seized by the townsmen, who thus made their peace with Constantius (A.D. 353). Magnentius slew himself to avoid being delivered up. While Julian held the government of Gaul under Constantius, the environs of Lugdunum were ravaged, and the town nearly captured by the Allemanni. The emperor Gratian, pursued by the usurper Maximus, was overtaken and slain at Lugdunum (A.D. 383). In the beginning of the fifth century, in the reigns of Honorius and his successors, the Burgundians seem to have possessed themselves of this town and of the south-eastern part of Gaul, under the sanction of the emperors, who employed them to oppose other barbarians of a fiercer character. [BURGUNDIANS.] On the overthrow of the Burgundian kingdom, Lugdunum came into the power of the Franks.

Lugdunum, during the Roman period, occupies a considerable place in ecclesiastical as well as in civil history. The Gospel had been early introduced into this part of Gaul, and here a severe persecution raged in the reign of Marcus Aurelius Antoninus (A.D. 172 or 177). The churches at Vienna (Vienne) and Lugdunum sent a relation of their sufferings to those of Asia and Phrygia. This account, ascribed by some to Irenæus, 'is written with simplicity and beauty, and is one of the most affecting passages in the antient history of Christianity.' (*Hist. of the Church*, in *Library of Useful Knowledge*.) Pothinus, bishop of Lyon, and perhaps the person who introduced the Gospel into these regions, was one of the martyrs in this persecution. His successor was Irenæus, one of the most eminent of the early Fathers.

In the division of the Frankish kingdom under the Merovingian princes, Lyon, as we may now call it, was included in the kingdom of Bourgogne or Burgundy (A.D. 561-613); but the city was depopulated by a fearful pestilence, and the troubles of the period and the rise of Châlons, which became a royal residence, were unfavourable to it. In the division of the Frankish empire among the grandchildren of Charlemagne (A.D. 843), Lyon, with the district of Lyonais, fell to the lot of the emperor Lothaire, and in the subsequent division of his states (A.D. 855) it fell to Charles, king of Provence, who made it his usual residence. On his death (A.D. 863) it was seized by Charles le Chauve, king of France. On the re-establishment of the kingdom of Bourgogne by Boson (A.D. 879) Lyon was included in his dominions. In the troubled period of the later Carlovingian kings of France, Lyon was subject alternately to that kingdom and to the kingdom of Bourgogne Transjurane. It was in these troubled times that the counts or governors of Lyon succeeded in establishing an hereditary sway, not over the city of Lyon so much as over the districts of Lyonais, Forez, and Beaujolais.

From about A.D. 955, Lyon was under the kings of Bourgogne Transjurane, and, upon the union of that kingdom with the Germanic empire, A.D. 1032, it became part of the domains of the emperors. Under the kings of Bourgogne the counts of Lyonais exercised the functions of government. The city was not however considered as a part of their hereditary fief; and in the reign of Rodolph III., surnamed Le Fainéant, Bruchard his brother, archbishop of Lyon, obtained the lordship of the city, which appears to have remained annexed to the see. The emperor Frederick Barbarossa (A.D. 1157) confirmed the temporal jurisdiction of the archbishops, extended it over all that part of their diocese which was in the kingdom of Bourgogne (*i.e.* on the east of the Rhône and Saône), and made them princes of the empire. The archbishops received the title of exarch: they were allowed free and independent jurisdiction, except so far as they were subject to the supreme authority of the emperor and the general laws of the empire. This grant excited the jealousy of the then count of Forez, and stirred up a war between him and the archbishop. Soon after this time Pierre Waldus, or Waldensis, one of the reformers of the church in the dark ages, lived and preached at Lyon.

At Lyon was held, A.D. 1245, the thirteenth general council, in which the pope Innocent IV. pronounced sentence of excommunication and deposition against the emperor Frederick II., on the ground of sacrilege and heresy. A new crusade for the recovery of the Holy Land was agreed upon, and it was determined to render aid to the emperor Baudouin, or Baldwin II. of Constantinople.

The citizens of Lyon appear at this time to have formed a powerful body. There was considerable trade carried on, and many Italian and Swiss families settled here. They were by no means satisfied with the government of their ecclesiastical rulers. Learning that Philippe II., Auguste, had established or extended the power of the municipality of Paris, they determined (in the early part of the thirteenth century) to elect a municipal body, which accordingly they did. The differences between them and the archbishop and chapter led at last to open hostilities; and the king of France (St. Louis) being one of the arbitrators appealed to in order to heal these disorders, his successors managed to bring the city under the dominion of the French crown. Philippe IV., Le Bel, received the citizens of Lyon under his especial safeguard and protection. The archbishops struggled stoutly for their rights; but in the reign of Philippe V., Le Long, the regal authority was firmly established.

In the year 1274 another general council was held at Lyon: at which the Greek church was professedly united to the Latin church, and several other important affairs brought under notice.

The remoteness of Lyon from the centre of the German empire, and the other more pressing occupations of the emperors, prevented them from interfering in the contest between the citizens of Lyon and their ecclesiastical governors, and the withdrawal of the city from the imperial government and its annexation to France took place with scarcely any opposition from the emperors. The political authority and a portion of the judicial authority were in the hands of the kings of France, and were exercised for them by officers appointed with the title of gardiateurs; by the baillis of Mâcon, who were seneschals of Lyon; and subsequently by the governors of the province of Lyonais. A portion of the judicial administration remained in the hands of the archbishops, and another portion in the hands of the municipality (or consulate, as it was termed), which constituted, down to the last century, a tribunal distinguished by its upright and enlightened decisions. Lyon continued to increase in population, wealth, and commerce. Its institutions were free; the citizens elected their own magistrates, controlled the receipts and expenditure of the municipality, and were exempt from the jurisdiction of any courts except those established in the city.

In the year 1362 Jacques of Bourbon, count of Maine, and his son Pierre, with several other nobles, were defeated and mortally wounded near Lyon by the 'free companies' who were at that time ravaging France. In the contest carried on with these marauders, the aqueducts which had conveyed water to the Roman Lugdunum, and the Roman bridge of Francheville, were ruined.

In the religious dissensions of the sixteenth century, Lyon suffered much at the hands of the Huguenots; but recovered its prosperity in the seventeenth and eighteenth centuries. The execution of Cinq Mars and De Thou, beheaded by order of Richelieu, A.D. 1642, took place in this city.

In the year 1793, during the government of the convention, the people of Lyon rose against the tyranny of the revolutionary club which had been established in the city; and seizing the Hôtel de Ville (or town-hall), condemned Challier, president of the club, whom they had captured, and put him to death. The population of Lyon in 1788 has been estimated at 180,000: other accounts make it to have been only 121,000 in 1791. It is likely that the troubles of the Revolution had diminished the prosperity, and with it the population of the city, but the great difference in the two statements makes it likely that one comprehended a larger portion of the environs than the other. Against this great city, the Convention sent an army of 60,000 men with a hundred pieces of cannon. The townsmen determined on resistance: 10,000 men engaged in the defence under the count of Précy, women and children caught the spirit of resistance, and the wealthy merchants and landowners devoted their fortunes to the providing of necessaries. The town was bombarded, and, though several successful sallies were made, was obliged, after a siege of sixty-six days, to yield to famine and force. The chief defenders quitted the place and retired towards Savoy, but were overtaken, and cut to pieces or dispersed by the hostile cavalry: about fifty, with the count de Précy, succeeded in reaching Savoy. The victorious army took possession of the now defenceless city, and a fearful train of cruelties followed for five months, under the direction of Couthon, Collot d'Herbois, and Maignet. The guillotine was rendered permanent; and its operation being too slow, the wretched prisoners were mowed down by grape-shot. Nearly six thousand victims perished, including those who fell in the defence; the principal buildings were demolished; and the Convention, as if in mockery, gave a new name to the city, that of Commune Affranchie.

This dreadful blow, together with the long war which followed the French revolution, caused the commerce and manufactures of Lyon to languish. In 1806 the population was estimated at less than 90,000, only half its population at the time of the fatal siege. On the return of Napoleon from Elba in 1815, the count of Artois (afterwards Charles X.), brother of Louis XVIII., the duke of Orléans (the present king of the French), and Maréchal Macdonald, hastened to Lyon: but on the approach of Napoleon, the populace and the army raised the cry of 'Vive l'Empereur,' and the princes retired. Napoleon took possession of the city, and issued a decree annulling the chief political changes made during his absence.

In 1834 Lyon was the scene of great disturbances. Unions for the protection of their interests had been formed by the artisans, who took the name of Mutuellistes; and a reduction of wages by the masters occasioned a general turn-out. Political feelings mingled with the irritation caused by these circumstances, acts of disorder called for the interference of the civil and military authorities, and several arrests were made. The determination to bring the parties arrested to trial led to an insurrection. The rioters fortified themselves with barricades, took possession of the suburbs, and the place was contested for two days, with a loss of nearly 200 men to the military and more than that number to the insurgents, who, finding it hopeless to continue the contest, laid down their arms.

Lyon is situated at the confluence of the Saône with the Rhône. The general direction of the Rhône previous to the junction is from east to west, but in the city and vicinity its course is from north-north-east to south-south-west. The general direction of the Saône is from north to south, but it makes a bend, convex to the east, round the base of the hill Fourvière just before its junction with the Rhône. The two rivers enclose between them a long tongue of land extending to the south or south-south-west, on which part of the city is built. The junction of the streams formerly took place just south of the then existing ramparts of the town, and below the junction was an island called Mognat, or Mogniat, and several shoals; but about sixty years since (A.D. 1776) a new and straight channel was cut for the Rhône, carrying the point of junction above a mile farther down the stream, converting a considerable part of the former bed of the river into dry land, and uniting the island of Mognat and the shoals with the main. The prolongation of the bed of the Saône between the former and present points of junction was formed on the western side of what had previously been the bed of the united streams. By this great alteration a large extent of ground was gained, over which new streets and buildings are continually extending. Another considerable part of the city is on the hill Fourvière and at the base of it, along the right bank of the Saône; it is surrounded on the west by the antient town-wall. There are the remains of fortifications on the north side of that part of the city which is between the two rivers. These fortifications run along the hill of La Croix Rousse, which rises on this side, and which occupies the whole of the interval between the Rhône to the Saône. On the south-west of the city, adjacent to the part on the right of the Saône, are the three faubourgs, or suburbs, of St. Irenée, St. Just, and St. Georges, or La Quarantaine. On the north-west, extending along the right bank of the Saône, is the faubourg of Vaize, which forms a distinct commune, or municipality. On the north is the new commune, or municipal district of La Croix Rousse, on the hill of that name, comprehending the suburbs of Le Serin on the left bank of the Saône and St. Clair on the right bank of the Rhône. On the left bank of the Rhône is the faubourg of La Guillotière, which forms with the quarter Les Botteaux another distinct commune, or municipal district. South of the city is the new quarter, on the land gained by altering the bed of the Rhône, called, from the architect who planned it, the Presqu'île (or Peninsula) Perrache.

The Rhône has a medium breadth of about 650 feet. Its current is very rapid, and it is liable to sudden and great inundations; to prevent the disastrous effects of which, an embankment has been formed to protect the suburb of La Guillotière. There are three bridges over it: the Pont Morand, a wooden-bridge; the Pont Charles X., which has the foundation of the piers of stone and the other parts of wood; and the Pont La Guillotière, a stone bridge, leading to the suburb of the same name. On the right bank of the river is a range of quays, not much used for commercial purposes, and partly planted with trees; south of the city, on the same bank, an avenue extends along the Presqu'île Perrache, forming the commencement of the road to St. Etienne; another avenue, extending northward from the quays, forms the commencement of the road to Bourg-en-Bresse and Geneva. These quays and avenues form a tolerably direct line of more than three miles in length. There are on the left bank of the Rhône a promenade, the 'Cours Bourbon;' and several public gardens and houses of entertainment much frequented on holidays.

The Saône has a slower current and a more winding course than the Rhône. It skirts the hill of Fourvière, a projecting crag of which stretches down to the river. A passage was made by the Romans along the bank by cutting away part of this crag, which derived from that circumstance the name of Petra Excisa, now Pierre-Scise. On the summit of the crag stood a Gothic castle, long the residence of the archbishops when lords of the city. After the war of the League, in the sixteenth century, it was made a state prison; and demolished after the siege of 1793. The crag, which consists of granitic rock, is perpetually diminishing, being quarried for building. Both banks of the Saône are lined with quays, and have several basins or docks for boats. It is crossed by seven bridges in the city. The Pont de l'Archevêché (formerly Pont de Tilsit) and the Pont du Change are of stone, and are remarkable, the first for its elegant architecture, and the second for its antiquity. The Pont de Serin and the Pont d'Ainay have the foundation of the piers in stone, the rest of wood. The Pont St. Vincent and the Pont Volant are wholly of wood. There is one suspension iron-bridge and it was designed to throw another over from the suburb of Vaize to that of Serin. We know not if this design has been executed.

Besides these seven bridges, there is one below the city, partly of stone and partly of wood, just at the junction of the Saône with the Rhône. Over this bridge the railroad from Lyon to St. Etienne passes. The traffic by boats on the Saône is very great.

Between the Rhône and the Saône, in the Presqu'ile Perrache is a cut with a basin for boats; another large basin is in the suburb of Vaize on the Saône.

The interior and more antient part of the town has narrow, wet, and dirty streets, paved with inconvenient round or projecting stones, and lined on each side by a row of curbstones, designed not for footpaths, but to preserve the shops from accident by carts or other carriages. The houses are old and gloomy, six or seven stories high, with narrow courtyards into which the rays of the sun rarely penetrate. They are chiefly built of stone, and are of solid construction. In the newer parts of the town are some handsome streets. The quays are lined with good houses; those on the bank of the Saône are older than those on the bank of the Rhône. The whole number of the streets was variously estimated ten years since at from two hundred and fifty to three hundred. The squares and other open spaces amounted to near sixty. The principal is the Place Bellecour, otherwise Place de Louis le Grand. It is above 300 yards in length and has a varying breadth of from about 200 to 240 yards; it is planted with lime-trees, and has in the centre a fine equestrian statue of Louis XIV., in the place of one destroyed at the Revolution. This statue, two fountains which adorned the Place, and the fine houses which surrounded it, were destroyed after the siege of 1793, and the Place remained long in ruins. In the north of the city is the Place des Terreaux; and at the southern extremity the Place Louis XVIII. lately built. The quarter of Bellecour is the residence of the most wealthy people; there are many good houses in the quarters of St. Clair, Les Terreaux, and Perrache; the quarter of St. Jean, on the right bank of the Saône, is occupied principally by the members of the bar. Lyon is remarkable for the contrast frequently presented by the mean hovels which may be seen in immediate juxtaposition with the most splendid mansions.

Of the public buildings the cathedral is one of the most remarkable. The western front, which is praised by some for its magnificence, is on the whole heavy, but it has three richly ornamented doorways, and over the central doorway a fine circular window. The interior of the building is of simple but striking architecture. In this cathedral there is a curious clock, which shows the year, the month, the day, the hour, the minute, and the second; the sun's place, the phases of the moon, and the saints' days of the calendar. It is now out of repair. The church of the Chartreux, on the slope of the hill of La Croix Rousse in the northern part of the city, has a good dome and a handsome high altar, that of St. Irenée (Irenæus), rendered a mere shell by the siege of 1793, has a handsome front; that of Enay is remarkable for four granite columns which support its cupola, and which were taken from a Roman temple, dedicated to Augustus, that occupied the same site; that of St. Nizier is of Gothic architecture with a Grecian portico, the work of Philibert Delorme; that of the Collège has a fine nave, and that of St. Just is a modern building in good taste and of elegant proportion. The churches of Lyon generally are but little worthy of notice. The Protestants occupy as a church a building originally designed for an exchange.

The archbishop's palace, though it has some fine rooms, has little exterior beauty. The Hôtel de Ville, or town-hall, is perhaps the finest public building in Lyon. It has a fine front with a clock-tower rising from the centre. It was built A.D. 1646-55, by Simon Maupin, and is considered the finest building of the kind in Europe, except that of Amsterdam. It forms one side of the Place des Terreaux; another side is formed by the former Benedictine abbey of St. Pierre, now called 'Le Palais du Commerce et des Arts.' It is used as an exchange, a repository for several museums or collections of objects of science and art, a place of meeting for several learned societies, a school of instruction in drawing, anatomy, &c., and for other purposes. The prefect's office, formerly a Dominican convent, is remarkable rather for its extent than its beauty. It has a tolerably extensive garden. The Hôtel Dieu, or hospital, and the Hôpital de la Charité, destined for foundlings and for the aged and infirm poor, front the banks of the Rhône; the former is a building of noble extent and appearance, with a fine dome in the centre. There are several theatres; the Grand Théâtre built by Soufflot has been lately replaced by a new building.

The population of Lyon in 1826 was 145,675: this number probably includes the inhabitants of Vaize, La Croix Rousse, and La Guillotière. In 1831 the population of Lyon was 133,715; that of the commune of Vaize was 4237 (of whom 3586 were in the town); that of the commune of La Croix Rousse was 9213 (of whom 9080 were in the town); and that of the commune of La Guillotière, 18,294 (of whom about 12,000 were in the town): together, 165,459. In 1836 the population of Lyon was 150,814; and if we estimate the increase of population in Vaize, La Croix Rousse, and La Guillotière to have been in proportion to that of Lyon, the aggregate population of the place will be little short of 185,000. Lyon is the greatest manufacturing town in France. Its staple manufacture is that of silk, which is highly esteemed for the durability of the colours and the good taste of the patterns. Mixed fabrics of silk and cotton and of silk and wool are manufactured; also shawls, crapes, silk stockings, gold and silver stuffs, ribands, and embroidery. The greater part of the silk produced in France is worked up in the looms of Lyon; and a large supply is drawn from Italy. The silk from the worms reared in the immediate vicinity of the city is naturally of a pure white. In 1828 the number of factories or smaller establishments for the silk manufacture in all its branches was 7140 within the walls of Lyon; the looms were 18,829; to which may be added, for the suburbs and the communes within about fifteen miles of Lyon on every side, about 5000 or 6000 looms: making in all 24,000 to 25,000 looms for the district of which this town is the centre. The hat manufacture, though it has declined from its former flourishing condition, is still considerable. Good earthenware is made, and gold-wire drawing is managed with great skill. Among the buildings devoted to the purposes of trade are the 'Condition des Soies,' where the merchants are obliged to deposit the silk brought to the city, that it may be effectually deprived of the moisture contracted in the throwing-mills or on the road; the depôt for colonial produce and foreign goods; and the depôt for salt. Among the subordinate branches of industry are printing and bookselling, and the manufacture of printed cottons, paper hangings, artificial flowers, iron goods, plate, jewellery, glass, and hardwares. There are breweries and curriers' shops. Trade is carried on in groceries, spices, and wines. Chesnuts form also a considerable article of trade: they are brought chiefly from the departments of Ardèche, Loire, Isère, and Var, and are sent from Lyon to various parts. The town is the emporium of the fine woollens of Elbœuf, Sedan, and Louviers, with which it supplies the other towns of the south; and of the oils and soaps of Provence, and the wines and brandies of Languedoc, which it despatches to the north of France. The mercantile men of Lyon have the reputation of close attention to business, exactness in calculation, prudence in their undertakings, and strictness in the fulfilment of their engagements. Wealth is more equally diffused than in other great commercial towns, and capitalists are less subject to great vicissitudes. Luxury has made less progress here than in similar places. Fondness for the country is a

eristic of the inhabitants. The beautiful environs
town are studded with country-houses; and on holi-
e vast population pours out of the town in swarms
y a purer air. Science and art are more cultivated
most other trading towns; they are however valued
for their bearing on commerce and manufactures.
n is the seat of an Académie Universitaire, the circuit
h comprehends the departments of Ain, Loire, and
There is a public library of 92,000 volumes and
00 (some authorities say 1500) manuscripts. There
ools of theology and medicine; a seminary for the
od; a royal academy of sciences, belles-lettres, and
d various other institutions for the promotion of
lge. There are three hospitals, a subscription dis-
a maternity society, a deaf and dumb institution,
y other charitable institutions. The archbishopric
(now united to that of Vienne) is very antient.
ese comprehends the departments of Rhône and of
the suffragans of the archbishop are the bishops of
Langres, Dijon, St. Claude, and Grenoble. There
rotestant consistory and a Jews' synagogue. The
yale of Lyon has under its jurisdiction the depart-
Ain, Loire, and Rhône: there are two prisons in
, and several subordinate judicial courts and fiscal
There are a mint, a royal powder refining-house,
yal snuff manufactory. Lyon is the capital of the
th military division, which includes the depart-
Rhône, Loire, Cantal, Puy de Dôme, and Haute

g the eminent natives of Lyon were the Roman
Claudius and Caracalla, the poet Sidonius Apol-
the architect Philibert Delorme, who built the
; the botanist Jussieu, and Maréchal Suchet.
rondissement of Lyon comprehends an area of 501
iles; it had, in 1831, a population of 292,370; in
330,044. It contains 126 communes, and is divided
antons, or districts under a justice of the peace.
IAIS, or LYONNAIS, a province of France pre-
he Revolution, deriving its name from the city of
ich was the capital of it. It was bounded on the
Bourgogne; on the east by the principality of
the district of Bresse, and the province of Dau-
m all which it was separated by the Saône and the
on the south by the districts of Le Vivarais and Le
Languedoc; on the west by Auvergne and Le
is or Bourbonnois. It was subdivided into three
Forez on the west and south, Le Beaujolais or
s on the north, and Le Lyonais proper on the east
LAIS; FOREZ]; and comprehended several towns
yon, as Beajeu, Villefanche, Feurs, Montbrison,
St. Etienne, L'Arbresle (formerly La Bresle),
t. Chamond, and others. It is now divided into
rtments of Rhône and Loire. The province of
ecame, in the anarchy which preceded the extinc-
e Carlovingian dynasty, an hereditary county; but
y does not appear to have included the city of Lyon.
ition of the county among the different branches
mily led to the separation of the lordship of
s and the county of Forez. It is not clear
he district of Lyonais Proper passed with the city
under the government of the archbishops of that
subsequently of the French crown, or whether it
ct to the county of Forez. The former is most

was the country of the Segusiani. It was in-
the Roman province of Lugdunensis Prima. It
quently in the power of the Burgundians and of
s. It does not appear that any part, except the
nvirons of Lyon, was incorporated with the Ger-
re. The counts of Lyonais and Forez were vassals
nch crown.
SIA, a genus of Conchifers belonging to the Mya-
p. Mr. G. B. Sowerby has described two species:
ta, found by Mr. Cuming at the island of Muerte,
to particles of sand in eleven fathoms water, and
omes rather irregular in form as it increases in
the other, *L. brevifrons*, found at Saint Helena, in
l, at depths ranging from six to eight fathoms, at-
particles of sand.
NIX, Wagler's name for a genus of birds with
e bill defended by very long bristles, and both
nearly equal, the wings very short and rounded,
il narrow. Example, *Lypornix striata* (Brazil).

Mr. Swainson arranges the form as a subgenus of *Tamatia* (Puff Birds) [BARBETS, vol. iii., p. 434], under the family *Halcyonidæ*. [KINGFISHERS, vol. xiii., p. 227.]

LYRA (the Harp), one of the old constellations, representing the lyre of Mercury (Aratus), of Mercury or of Orpheus (Hyginus). It is surrounded by Cygnus, Aquila, Hercules, and the head of Draco. Its brightest star, *α* Lyræ, also called Vega, is a conspicuous object. If a line be drawn through the middle of Cassiopea, the pole-star, and the middle of Ursa Major, this star may be seen nearly in the perpendicular to that line drawn through the pole-star. When Aquila is known, a line drawn through its four neighbouring stars, *θ*, *β*, *α*, and *γ*, will pass through *α* Lyræ. Its principal stars are as follows:—

Character.	No. in Catalogue of		Magnitude.
	Flamsteed.	Astron. Society.	
κ	1	2113	5
α	3	2156	1
ε	4	2169	5
	5	2170	6
ζ	6	2171	5
β	10	2177	3
δ^2	12	2191	4
γ	14	2200	3
η	20	2232	6
θ	21	2242	6

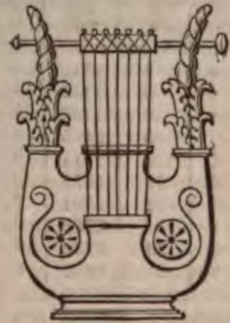
LYRA. (Ornithology.) [MÆNURA.]

LYRE (Λύρα), a musical instrument of the stringed kind, known, under various names, from the earliest historical period. The Greeks ascribe its invention, some to Mercury, some to Apollo; but it is possible that they may have had it from the Egyptians, and the Egyptians from Asia. Indeed Holy Writ leads us to conclude that it was of antediluvian origin. Jubal, the seventh only in descent from Adam, was 'father of all such as handle the harp and organ;' and as by the word *harp* we are to understand either the *lyre* itself, or some instrument analogous to it, we must, on such authority, grant to the son of Lamech the merit of being its inventor. In our version of the Scripture, *kinnor* (כנור) is rendered by the word *harp*, while the Septuagint and Vulgate give the Hebrew term a Greek form—*κιθάρα*, *cithara*, a word generally, though we believe erroneously, supposed to be synonymous with *λύρα*, or lyre. Erroneously, we say, because it is our opinion that Lyre and Cithara (or guitar) were generic terms; the first being the parent of all instruments of the harp kind, having no neck, or finger-board; the last, of all those furnished with a neck, and which finger-board probably was divided by frets. [GUITAR, HARP.]

It is true that in all the remains of Grecian art, no instrument with a neck is to be found. Artists perhaps preferred the more compact and elegant form of what is now called the Grecian lyre. The same taste descended to the moderns; witness the statue of Handel in Vauxhall Gardens, as Dr. Burney well remarks. Montfaucon tells us that he had examined the sculptured representations of six hundred antient lyres and citharas, and found not one with a neck. But had the learned father—who was a most excellent and indefatigable antiquary—lived in the present day, he would have met with abundant evidence in Egypt to prove that instruments with necks—instruments of the guitar kind, such as were subsequently called *lutes*—existed at least three thousand years ago. The three-stringed guitar, says Mr. Wilkinson (*Manners and Customs of the Antient Egyptians*), was in use at the earliest period of the Egyptian history; 'those at the pyramids are apparently of a date long previous to Osrtasen, or the arrival of Joseph.' And in Rosellini's splendid work 'I Monumenti dell' Egitto e della Nubia' are many engravings, some coloured, exhibiting instruments of great antiquity, resembling in essential points the modern guitar, or lute, with a neck, but this much elongated.

The most antient Grecian lyre—said to have been formed by Mercury from the shell of a tortoise, and of which the subjoined is a representation, as given by Mersenne—

had but three strings. That of Terpander (from Blanchinus) had seven, and took the annexed form—



Timotheus increased the number to eleven; and others were gradually added, till they reached sixteen, fifteen of which rendered the principal sounds in the Greek scale, and the sixteenth was the *Proslambanomenos, i.e.* the added or supernumerary sound.

LYRIC POETRY is commonly understood to be that kind of poetry which is composed in order to musical recitation, but the epithet has been transferred to all kinds of verse partaking in any degree of the same nature as that to which it was at first applied. Thus we hear of lyrical ballads, the greater part of which might with as great propriety be called epical, and of lyric measures in Horace, where there is no ground to suppose that they were sung, and no fitness for the purpose of musical rehearsal. In a former article [EPIC POETRY] we have endeavoured to point out a distinction between epic and lyric poetry more satisfactory than common language allows; but there is surely no impropriety in giving a decided meaning to words which have usually been understood in a confused sense, particularly when, as in the present case, the same senses have been applied to each, so as not only to confuse but to confound them. Pursuing then the course which we have pointed out, lyric poetry must be defined as that class of poetry which has reference to and is engaged in delineating the composer's own thoughts and feelings, in distinction from epic poetry, which details external circumstances and events.

A very slight glance at the growth of society will be enough to show us that lyric poetry is posterior in point of time to epic. Men think of war and hunting, of anything and everything which surrounds them, before they look at themselves; and as consciousness in the child comes much later than the exercise of all the senses, so that it learns the names of many objects before it begins to call itself 'I'; so in the development of national life the epic period comes before the lyric. Homer and Hesiod were favourites for centuries before the invention of an epigram or a chorus; the narrative novel or romance precedes the novel of manners, and our own epical cycles existed long before anything in the form of lyric poetry.

The history of lyrical poetry is perhaps subject to greater difficulties than any other species of composition. In that nation where it attained to its most perfect growth, it is precisely that class of its literature which is to us, except in regard to one author, a total blank. Pindar is nearly all that remains to us of the whole lyric poetry of Greece, and great as his reputation has deservedly been, we have no reason to consider him as paramount to his class, and very good reason for denying to him what has commonly been considered his right, that of presenting us with the purest type and example of a lyric poet. With almost as much reason might he be called an epic writer, for many long passages occur in which he does not deviate at all from the path of narration, while in others again he is all but a dramatist. Thirlwall has observed too, that 'even if it was certain that his genius was unequalled, still it could not replace the freshness which we might expect to find in the earlier gushes of the lyric vein, nor that peculiar character which distinguished each of the other poets, nor that which belonged to the several schools formed by the great tribes or branches of the nation.' We have thus to deplore in Tyrtæus the loss of writings which kept up the patriotism of a whole nation; in Hipponax and Archilochus, all the circle of Greek satire; in Anacreon, the first poems on the fruitful subjects of love and feasting; and in Mimnermus, the Greek elegy, that offspring of the sadness which reflection on the fleeting nature of human enjoyments produces. But most of all have we to regret that scarcely any trace remains of that link between epic and lyric poetry which was the origin of Greek tragedy. This was perhaps the most national form of lyric poetry among the Greeks, the others having been for the most part rather the productions of individual imaginations, which gained popularity in proportion as they found sympathy, much in the way in which modern poetry makes its way into notice.

Ulrici, in his very elaborate work on the history of Greek poetry, gives two as the principal sources from which lyric poetry was derived—religious worship, and the individual feelings of the people; the first of which elements is traceable in one of the two kinds of epic poetry, which we named *hieratic*, while the second is that in which consists the difference between epic and lyric poetry. He proceeds to divide Greek lyric into the Doric, Æolic, and Ionic kinds: which correspond nearly, the first to what is to be found in choruses; the second to love-songs, such as Sappho's, and drinking-songs, or scolia; and the third to the elegy, epigram, and satire of Callinus, Archilochus, Tyrtæus, Hipponax, and others. We have no space to do more than notice his division of the subject, but the whole work will repay a far closer attention.

It has been remarked that both in epic and in lyric poetry the Romans possessed nothing like a school of poets, while in Greece there was a regular progression from epic to lyric schools, each of which supplied many individuals grouped round a principal figure in each class. Virgil and Lucan are the types of Roman epic poetry, and Horace stands almost alone as a lyric poet. But to attempt to give a history of Roman lyric would be little else than to enumerate every man who wrote verses from Ennius downwards, for almost every one of them attempted that as well as all other kinds of poetry. The whole of Latin poetry was in fact on a Greek model, even the most original of the Latin poets having borrowed his metres, though he might make everything else his own.

It might perhaps startle any one to be told that satire is a branch of lyric poetry, and that the most important branch of Roman lyric is satire. But a careful review of the definition with which we started cannot fail to explain this. Satire is essentially lyrical or subjective in its nature, and the Roman satire more so than the Greek, inasmuch as it partakes far less of the nature of lampoon or ludicrous description, and deals more with general than with individual traits of character. In their satire it is that we must look for information on Roman modes of thought and feeling. It was, or at least appears to us to have been, the only outlet which the Imperial tyranny gave to the free and noble spirit of Rome in her best days, and it is quite astonishing how far this liberty was employed. What it was in earlier days we cannot tell, except as far as Horace's description of Lucilius avails. The words may mean almost anything, but we should be inclined to suppose that it partook much more of the nature of lampoon than in later times. To the satire we may add its powerful auxiliary the epigram, the same in name but very different in nature from its Greek fellow, which ought rather to be called epigraph, or even epitaph

The Horatian lyrics merged in the later ages of the empire into a species of poetry much though undeservedly neglected, we mean the rhyming verses of the monks, which contain much Hebrew sublimity expressed in most sonorous verses. They are curious as affording the best specimen of the transition from scansion to accent, that is, from the antique to the modern rule of versification.

English lyrical poetry is late in its full development, for to call our ballads lyrical is a misnomer, seeing that the prose and poetical romances often give exactly the same story in another shape. We need go no further than the ballad 'Mort d'Arthur,' so well known to readers of Percy's 'Reliques.' At the same time, though the form of these ballads is mostly narrative or epical, there is often a strong admixture of lyrical feeling, as in 'The Jew's Daughter,' 'Sir Cauline,' and others. Scarcely any poems occur before the time of Milton deserving the title of lyrical, except perhaps some of Giles and Phineas Fletcher's works and Shakspere's sonnets. In 'Lycidas,' 'Il Penseroso,' and 'L'Allegro,' we see almost the first, and perhaps the most beautiful examples our language can boast. The prevalence of French taste until the revival of poetry at the close of the last century gave so artificial a character to the works of Dryden, Pope, and their successors, that we can hardly give the title of lyrical to any of them excepting the satires and a few fine odes. In our own day Wordsworth and Coleridge are too well known to require that we should point out how exclusively lyrical is the tendency of their works. Shelley has combined more of what is called sensuous beauty with the rest of the qualities requisite to make up a lyrical poet; and, among living poets, Tennyson may perhaps be mentioned as giving the greatest promise of lyrical excellence, although he has yet written so little, and that little has so many of the redundancies of a young writer, that it is hard to predict with certainty his future course.

It is natural to anticipate what may be the course of poetry in our own time, and perhaps the balance of probability is on the side of its taking a lyrical or subjective character. Novels have shut out the drama, and epic poetry is utterly at variance with the feelings of the age; so that if our children are to have any poetry at all, it must apparently partake largely of a lyrical character, and that probably not unmixed with satire, of which, since the 'English Bards and Scotch Reviewers,' we have had scarcely a specimen.

(Ulrici's *Geschichte der Hellenischen Dichtkunst; Dunlop's Hist. of Roman Literature; Quarterly Review*, articles on Pindar and Horace.)

LYRICS are those verses which are commonly used in lyrical poetry. Such are those of Pindar, of Horace's odes, and of the tragic and comic choruses. They are generally short, in order, as is said, to agree better with the time of any music which might have been intended to accompany them. The old grammarians divided all verses into those in which the metre was repeated in each line (*κατὰ στίχον*), such as hexameters, iambics, and trochaics, and those which require more lines than one to make up a system (*κατὰ σύστημα*), as in the case of Sapphic or Alcaic verses, or a choric strophe. The latter division contains almost all the lyric metres known, including nearly all Horace's odes, all Pindar's, and all the choruses and even anapæstic systems. Of these strophes a further division has been made, into *longer*, such as Pindar, Stesichorus, Simonides, and the Greek dramatists employed; and *shorter*, such as those of the earlier Ionian and Æolian poets, of their imitators, and of Seneca, besides rare examples in the Greek dramatists.

Hermann further distinguishes the longer strophes into Dorian, Æolian, and Lydian, of which he gives examples from Pindar to prove that the first was used where impressive majesty was requisite, the second to give a notion of rapidity and vehemence, and the third as possessing part of the qualities of each.

A question has arisen, and it is at all events a curious point, why lyrical poems are generally divided into lines so much shorter than heroic. That such was the case in Greek and Roman poetry is certain, and it is not explained by saying that they were sung to an accompaniment, for surely there is just as much reason to suppose that Homer's long hexameters were chanted as Anacreon's short iambics, and music might be as well adapted to one as to the other.* Perhaps it is better accounted for by considering that a lyrical poem does not consist of descriptions, where the same sense may be expressed in many ways, but in thoughts, which, to be striking, must be terse. Take for example the famous verses—

Ὑγιαίνειν μὲν ἄριστον ἀνδρὶ θνατῷ·
δεύτερον δὲ, καλὸν φυὰν γένεσθαι·
τὸ τρίτον δὲ, πλουτεῖν ἀδόλως·
καὶ τὸ τέταρτον, ἡβᾷν μετὰ τῶν φίλων.

Hesiod would probably have spun them out into five or six hexameters,* inserting epithets and expanding at pleasure, but converting each from the expression of a moral sentiment in which the hearer is supposed to agree, into the inculcation of a precept of prudence which he is to follow. (Hermann, *Elementa Doctrinæ Metricæ*.)

LYRIOCE'PHALUS. [IGUANIDÆ.]

LYRU'RUS. [BLACK-COCK; TETRAONIDÆ.]

LYS. [BELGIUM; SCHELDE.]

LYSANDER, a Spartan, who rose to eminence towards the end of the Peloponnesian war, and was placed in command of the Lacedæmonian troops on the coast of Asia Minor, B.C. 407. Having about him little of the old Spartan severity, and being ready to sacrifice that personal and national pride and inflexibility, which were the peculiar characteristic of the Spartan institutions, to personal or national interests, he gained in an unusual degree the regard and confidence of his Persian allies. This he used to the best advantage, by seizing a favourable moment to obtain from the younger Cyrus, the Persian viceroy in Asia Minor, in place of any personal advantage, the addition of an obolus daily (rather more than a penny) to every seaman in the Peloponnesian fleet. During his year's command he defeated the Athenian fleet, commanded by Antiochus, as lieutenant of Alcibiades, at Notium. In September, 406, he was superseded by Callicratidas; who was defeated and slain in the memorable battle of Arginusæ. The allies then petitioned that Lysander might be re-appointed. It was contrary to Spartan law to entrust the fleet twice to the same person; but this difficulty was evaded by nominating another person commander-in-chief, and sending Lysander as lieutenant with the command in Asia. He soon justified the preference, by gaining the decisive victory of Ægospotami, in the Hellespont, where 170 Athenian ships were taken. This in effect finished the war. Receiving as he went the submission of her allies, Lysander proceeded leisurely to Athens, and blockaded the ports, while the Spartan kings marched into Attica and invested the city, which, unassaulted, was reduced by the sure process of famine. The capitulation being settled, B.C. 404, Lysander had the proud satisfaction of entering as a victor the Peiræus, unviolated by the presence of an enemy since the Persian invasion.

His services and reputation gained for him a corresponding weight in Sparta; and on occasion of the contested succession his influence was powerful in raising Agesilaus to the throne. He accompanied that eminent statesman and soldier during his first campaign in Asia, where his popularity and renown threw his superior into the shade; and an estrangement resulted, in which Lysander behaved with temper and wisdom. About B.C. 396 he returned to Sparta. In the following year, on occasion of a quarrel with Thebes, he was sent into Phocis, to collect contingents from the northern allies, a task for which his name and popularity rendered him peculiarly fit. Having done this, and being on his way to join the Lacedæmonian army, he was taken by surprise, and slain by the Thebans, at Haliartus in Bœotia. The force which he had collected dispersed; and the war came at once to an end, with no credit to the Lacedæmonians, B.C. 395.

It is said that, urged by ambitious hopes, he meditated a scheme for abolishing the hereditary right of the descendants of Hercules, and rendering the Spartan throne elective, and that he had tampered largely with different oracles to promote this scheme. The contemporary Xenophon however makes no mention of this rumour. This subject has been discussed by Mr. Thirlwall in an appendix to his fourth volume of the 'History of Greece.' [ALCIBIADES; ATHENS; AGESILAUS.]

(Plutarch's *Life of Lysander*; Xenophon's *Hellenica*.)

LY'SIAS, one of the ten Athenian orators, was born at Athens, B.C. 458. His father Cephalus was a native of

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* The Huntsmen's chorus in 'Der Freischütz' is perfectly adapted to hexameters.

* In the following way:—

Ὦ Περσῆ τόδ' ἄριστον ἐπιχθονίοις ἀνθρώποις,
Λοιμοὺς ἐκ μελάθρου καὶ ἀπεχθέα νοῦσον ἐλαύνειν
Τῆς δὲ φυῆς καλῆς μετέχειν, τόδε δεύτερον αἰνῶ·
Καὶ τὸ τρίτον, πλουτεῖν ἀδόλως· τέτρατόν τε, φίλοισι
Ξὺμ πιστοῖσιν ἐμὸν διάγειν βίον ἠδ' ἀποθνήσκειν.

Syracuse, who settled at Athens during the time of Pericles; he was a person of considerable wealth, and lived on intimate terms with Pericles and Socrates. His house is the supposed scene of the celebrated dialogues of Plato's 'Republic.'

Lysias, at the age of fifteen, went to Thurium in Italy, with his brother Polemarchus, at the first foundation of the colony. Here he remained for thirty-two years; but in consequence of his supporting the Athenian interests, he was obliged to leave Italy after the failure of the Athenian expedition in Sicily. He returned to Athens B.C. 411, and carried on, in partnership with his brother Polemarchus, an extensive manufactory of shields, in which they employed as many as 120 slaves. Their wealth excited the cupidity of the Thirty Tyrants; their house was attacked one evening by an armed force, while Lysias was entertaining a few friends at supper; their property was seized, and Polemarchus was taken to prison, where he was shortly after executed (B.C. 404). Lysias, by bribing some of the soldiers, escaped to the Piræus, and sailed from thence to Megara. He has given us a graphic account of his escape in his oration against Eratosthenes, who had been one of the Thirty Tyrants.

Lysias actively assisted Thrasybulus in his enterprise against the Thirty; he supplied him with a large sum of money from his own resources and those of his friends, and hired a considerable body of soldiers at his own expense. In return for these services Thrasybulus proposed a decree, by which the right of citizenship should be conferred upon Lysias; but in consequence of some informality this decree was never carried into effect. He was however allowed the peculiar privileges which were sometimes granted to resident aliens (namely, ἰσοτέλεια). Lysias appears to have died about B.C. 378.

The author of the life of Lysias, attributed to Plutarch, mentions four hundred and twenty-five orations of Lysias; two hundred and thirty of which were allowed to be genuine. At present there are thirty-four extant, attributed to this orator. But some of these may not be genuine; and at least the 'Epitaphius' bears strong internal evidence of being by another hand.

Dionysius of Halicarnassus has written a laboured essay on the style and merits of Lysias. He allows him almost every excellence except those of sublimity and the power of strongly moving the passions. 'His style,' he observes, 'is not so well adapted to show the power of art as to represent the truth of nature.' In narrating events or circumstances, Dionysius considers him as superior to all the orators, and as the rule and model in this department of the art. The 'Apology for the death of Eratosthenes' is a pattern of simple and perspicuous narration.

According to Suidas and other antient biographers, Lysias also wrote some treatises on the art of oratory (which he is said by Cicero (*Brut.*, c. 12) to have taught), and discourses on love. There is still extant a treatise on love, which bears the name of Lysias, and which has been edited by Haenish, Leip., 1827, but this work evidently belongs to a much later period in Greek literature.

The best edition of the text of Lysias is by Bekker. Useful editions have also been published by Taylor, 1738; by Foertsch, 1829; and by Franz, 1831. Lysias has been translated into French by Auger, Paris, 1783, and into English by Gillies, together with the orations of Isocrates, London, 1778.

(Dionysius of Halicarnassus; *Life of Lysias*, attributed to Plutarch; Photius, C., 261; *Life of Lysias*, prefixed to Taylor's edition.)

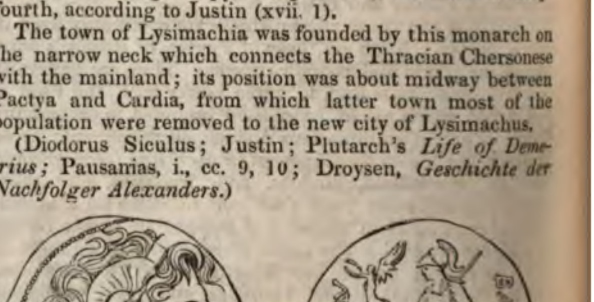
LYSI'DICE, Savigny's name for a genus of *Dorsibranchiate Annelids* [DORSIBRANCHIATA], which, with jaws like those of *Eunice* (Cuv.), or even more numerous than in that form, and often unequal in number, have only three tentacles, and cirrhi for *branchiæ*. See Savigny (*Eg. Annel.*), and Cuvier (*Règne Animal*).

LYSI'MACHUS, one of the officers of Alexander the Great, was born of an illustrious Macedonian family. (*Justin*, xv. 3.) In the general distribution of the provinces, or satrapies, to the chief Macedonian officers after the death of Alexander, Lysimachus received Thrace and the neighbouring countries. It was not however without difficulty that he obtained possession of the province which had been assigned to him; he was vigorously opposed by Seuthes, king of Thrace, and other native princes, and it was some time before his power was firmly established in the country. In B.C. 314 he joined Cassander, Ptolemy, and Seleucus in their endeavour to check the power of Antigonus [ANTIGONUS, p. 102]; but he does not appear to have been able to take an active part against Antigonus, in consequence of the revolt of many Thracian tribes who had been excited by Antigonus to make war against him. The peace, which was made between the contending parties B.C. 311, lasted only for a short time; and the war was continued with various success till the conquests of Demetrius, the son of Antigonus, in Greece, roused the confederates to make more vigorous exertions; and Lysimachus was accordingly sent into Asia Minor, B.C. 302, where he took several places, and acquired immense plunder. Antigonus hastened to meet him, but could not force him to a battle. In the following year Lysimachus, having formed a junction with the forces of Seleucus, met Antigonus at Ipsus in Phrygia, where a bloody battle was fought, in which Antigonus was killed and his army entirely defeated.

The dominions of Antigonus were divided among the conquerors, and Lysimachus obtained the north-western part of Asia Minor. He shortly afterwards married Arsinoe, the sister of Ptolemy, king of Egypt, although his eldest son Agathocles had already married Lysandra, the half-sister of Arsinoe. In B.C. 286 he obtained possession of the throne of Macedon, and obliged Pyrrhus, king of Epirus, who had laid claims to the kingdom, to retire to his native dominions. Hitherto the career of Lysimachus appears to have been fortunate, but the latter part of his life was embittered by family dissensions and intestine commotions. Arsinoe, fearful lest her children should be exposed after the death of her husband to the violence of Agathocles, persuaded Lysimachus to put him to death. Agathocles had been an able and successful general; he was a great favourite with the people, who deeply resented his death; and Lysimachus found himself involved in almost open war with his subjects. Lysandra, the widow of Agathocles, fled to Babylon, and entreated Seleucus to make war against Lysimachus. The Syrian king was willing enough to take advantage of the troubled state of his rival's kingdom; but Lysimachus, anticipating his intentions, marched into Asia, and fell in a battle with the forces of Seleucus, in the seventieth year of his age, according to Appian (*Syr.*, c. 64), and in his seventy-fourth, according to Justin (xvii. 1).

The town of Lysimachia was founded by this monarch on the narrow neck which connects the Thracian Chersonese with the mainland; its position was about midway between Pactya and Cardia, from which latter town most of the population were removed to the new city of Lysimachus.

(Diodorus Siculus; Justin; Plutarch's *Life of Demetrius;* Pausanias, i., cc. 9, 10; Droysen, *Geschichte der Nachfolger Alexanders.*)



Coin of Lysimachus.
British Museum. Silver. Actual Size.

LYSIPPUS, one of the most celebrated statuaries of antiquity, was born at Sicyon. He was particularly distinguished by his statues in bronze, which are said to have been superior to all other works of a similar kind. He introduced great improvements in his art, by making the head smaller, and giving to the body a more easy and natural position than was usual in the works of his predecessors. Pliny informs us that his statues were admired among other things for the beautiful manner in which the hair was always executed. (Plin., xxxiv. 8.)

Lysippus is placed by Pliny in the 114th Olympiad (B.C. 324), contemporary with his brother Lysistratus, Sthenis, Euphronides, Sostratus, Ion, and Silanion. He is said to have been self-taught, and to have attained his excellence by studying nature alone. His talents were appreciated by his contemporaries; the different cities of Greece were anxious to obtain his works; and Alexander is reported to have said, that no one should paint him but Apelles, and

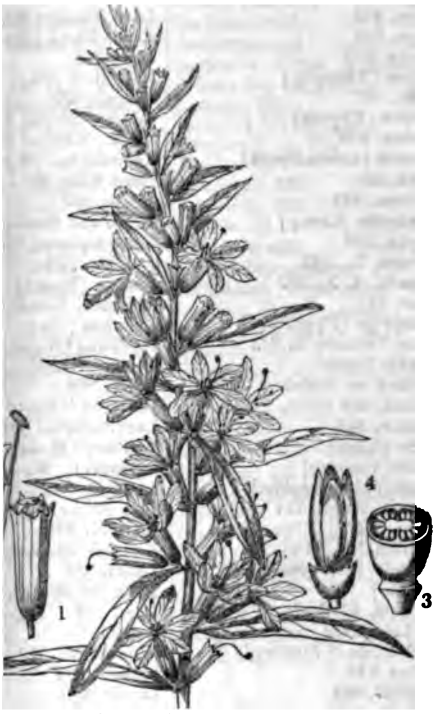
sent him in bronze except Lysippus. (Plin., vii.
'd Div., v. 12.) His reputation survived his
y of his most celebrated works were brought to
hich they were held in so much esteem, that
aid to have almost excited an insurrection by
statue of Lysippus, called Apoxyomenos, from
ths, where it had been placed by Agrippa, to
ce.

s said to have executed 610 statues, all of the
it (Pliny, xxxiv. 7); many of which were colos-
Pliny, Pausanias, Strabo, and Vitruvius have
ig lists of his works; of which the most cele-
ır to have been, various statues of Alexander
different periods of his life; a group of eques-
of those Greeks who fell at the battle of the
he Sun drawn in a chariot by four horses at
colossal statue at Tarentum; a statue of Her-
yzia in Acarnania, which was afterwards re-
Rome; and a statue of Opportunity (καιρὸς),
as a youth with wings on his ankles, on the
g from the earth.

e numerous pupils of Lysippus, the most cele-
iares, who executed the colossal figure at Rhodes.
listoria Naturalis; Pausanias; Junius, *De
rum*, p. 109-116.)

TA, Risso's name for a genus of *Macrurous
ustaceans*, allied to the *Shrimps*.

'CEÆ, a natural order of polypetalous Exogens, the essential character of which is to have a tubular calyx with conspicuous complete ribs, petals inserted into the orifice of the calyx, stamens springing from its base or middle, and a superior polyspermous ovary. They are most near Melastomaceæ and Onagraceæ. The order contains few plants of any interest. Some of the genus Lagerströmia are handsome Indian large-flowered bushes, represented in South America by Diplusodon; a few Ammannias have acrid leaves, which act as vesicants when applied to the skin; and the Henné dye used by Oriental women for their nails is the juice of the fruit of Lawsonia. Lythrum Salicaria, the subject of the preceding cut, is an English type of the order.



Lythrum Salicaria.

al; 2, a calyx cut open and showing the insertion of the
nsverse section of an ovary; 4, a ripe capsule, with its four

LYTTELTON, GEORGE LORD, born in January, 1708-9, the eldest son of Sir Thomas Lyttelton, Bart., of Hagley, in Worcestershire, was educated at Eton, and Christchurch, Oxford, at both of which his scholastic acquirements and promising talents gained him much credit. After travelling on the Continent for some time, he entered parliament in 1730, connected himself with the leaders of the opposition to Sir Robert Walpole, and acquired eminence and weight as a parliamentary speaker. He was a favourite of Frederic, Prince of Wales, at whose court he filled the office of secretary. After Walpole's retirement, Lyttelton was made a lord of the treasury, in 1744. He was raised in 1756 to be chancellor of the exchequer, a place for which his qualifications were but limited, if the story be true that he never could comprehend the simplest rule of arithmetic. He resigned that office to Mr. Legge in less than a year, and went out of office altogether on the dissolution of the ministry in 1759; at which time (his father being dead) he was raised to the peerage by the title of Baron Lyttelton of Frankley. The rest of his life was chiefly devoted to literature. He died in 1773.

Lord Lyttelton's literary talents in early life won the affection of Pope. His poetry, though elegant and tasteful, does not rise above mediocrity; it has however gained for him a place in Johnson's 'Lives.' Of his prose works the chief are: 'Observations on the Conversion and Apostleship of St. Paul,' 1747, the result of those studies by which, in middle life, he was converted from scepticism into a sincere and zealous believer in Christianity. This work has enjoyed a high reputation. 'Dialogues of the Dead,' 1760, a popular and amusing work. 'History of Henry II.,' to which is prefixed an account of the Revolutions of England, from the death of Edward the Confessor to the birth of Henry II., 1764-7. This is a learned, laborious, and valuable work, the fruit of twenty years' research. Miscellaneous Works, 1774. Poetical Works, 1785. Lord Lyttelton took a leading part, by his 'Account of a Journey in Wales,' in opening the eyes of the English to the beauties of their own country; and by the tasteful and expensive improvements in his celebrated park at Hagley, in introducing the modern practice of landscape gardening.

Lord Lyttelton's private character was exemplary; his acquirements extensive; his judgment as a politician and man of the world penetrating. But his indolence prevented him from doing justice to his own powers, exposed him to imposition, and led him into some embarrassments. His son Thomas lord Lyttelton, who died early in 1779, also possessed great abilities, but wasted and debased them in a profligate and unhappy life.

INDEX TO THE LETTER L.

VOLUME XIII.

L, page 259
La, in music, 259
Laaland, 259
Labarraque's Disinfecting Liquids, 259
Lábeo, 259
Lábeo, C. Antistius [Justinian's Legislation]
Lábia [Forficulidæ]
Labiátæ [Lamiaceæ]
Labidoura [Forficulidæ]
Lábidus [Mutillidæ]
Labiénus [Cæsar]
Lablab, 259
Laboratory, 260
Laborde, J. B., 260
Labour [Wages; Wealth]
Labour, Pays de [Basques, Pays des; Guyenne and Gascogne]
Labrador [Hudson's Bay]
Labradorite, 260
Labrax, 260
Lábridæ, 260
Labroides [Labridæ]
Labrus [Labridæ]
Labruyère [Bruyère, La]
Laburnum, 262
Labyrinth [Crete; Faioum]
La Caille, 262
La Châtre [Châtre, La]
La Condamine, 263
Lac, 263
Laccadive Islands, 264
Lace, 264
Lacedæmon, Lacedæmonians [Sparta]
Lacépède, 265
Lacerta (constellation), 265
Lacértiadæ, 265
Láchesis [Viperidæ]
Lachrymal Organs, Diseases of the, 266
Lachrymatory, 266
Lachsa, or Lahsa [Arabia]
Lacistemáceæ, 266
Lacónica, 266
Lacquering [Japanning]
Lactántius, 267
Lacteals, 267
Lactic Acid, 268
Lactucáricum, 268
Lactucic Acid, 268
Lacúna [Trochidæ]
Ladakh, 268
Ládanum, 269
Ladoga, Lake [Russia]
Ladrone Islands, 269
Laeken [Brussels]
Læmodípoda, 270
Laennec, 270
Laer, P. van [Bamboccio]
La Fayette [Fayette, La]
La Fontaine [Fontaine, La]
Lagána, 271
Lagerstrœ'mia, 271
Laguy, T. F. de, 271
Lágo Maggióre, 271
Lágomys [Leporidæ]
Lagoon, 271
Lágopus [Tetraonidæ]
Lagos, 272
Lagóstomys, 272
Lágothrix, 273
Lágotis [Chinchillidæ, vol. vii., p. 83]
Lagrange, 272
Lagriidæ, 274
La Harpe [Harpe, La]
Lahire, P. de, 275
Lahn, river [Rhine]
Lahore, province, 275
Lahore, city, 275
Laibach, or Laybach [Illyria]
L'Aigle [Orne]
Lainez [Jesuits]
Lairesse, Gerard, 276
Laity, 276
Lake, Gerard, 276
Lakes, 276
Lakes (pigments), 278
Laland [Laaland]
Lalande, 278
Lama [Llama]
Lama, Lamaism, 280
Lamantin [Whales]
Lamarck, 280
Lamb [Sheep]
Lamb, Charles, 281
Lamballe [Côtes du Nord]
Lambarde, W., 281
Lambert, John, 282
Lambeth, 282
Lambrus, 282
Lamégo, 282
Lamellária [Pleurobranchus]
Lamellibranchiáta, 283
Lamellicornes, 283
Lamellirostres, 283
Lamentations of Jeremiah [Jeremiah]
Lamiáceæ, or Labiátæ, 283
Lamian War, 283
Laminarites, 283
Lammas Day, 283
Lamouroux, J. V. F., 284
Lamp Black, 284
Lamp, Safety, 284
Lampornis [Trochilidæ]
Lamprey [Petromyzon]
Lamprídius, Ælius [Augusta Historia]
Lámprotes [Tanagers]
Lamprótila [Kingfishers, p. 232]
Lamprotornis [Sturnidæ]
Lampy'ridæ, 285
Lanarkshire, 286
Lancashire, 288
Lancaster [Lancashire]
Lancaster, Sir James, 300
Lancelot Claude [Port Royal]
Lancéola, 300
Lanceróta, or Lanzarote [Canaries]
Lanciáno [Abruzzo]
Land, 300
Land-tax, 300
Landau, 301
Landen, James, 301
Lander [Quorra]
Landernau [Finistère]
Landes, Les, 301
Landes, department, 301
Landing Waiter, 302
Landgrave, 303
Landguard Fort [Harwich]
Landrécy, or Landrecie [Nord]
Landscape Gardening [Garden]
Landscróna, 303
Landshut, 303
Lanfranc, 303
Lángaha [Viperidæ]
Langhorne, John, 303
Langeland [Denmark; Funen]
Langres, 304
Langtoft, Peter, 304
Langton, Stephen, 304
Language, 304
Langue d'Oc [France (Literature)]
Languedoc, 320
Languedoc, Canal de [France]
Lániadæ [Shrikes]
Lanióɡerus [Nudibranchiata]
Lanner [Falconidæ, vol. x., p. 181]
Lannion, 322
Lánsium, 322
Lantána, 322
Lantier, 322
Lanzi, 323
Laócoon, 323
Laomedéa, 324
Laon, 324
Laos, 324
Lapis Lázuli [Lazulite]
Lápithæ [Centaurs]
Laplace, 325
Lapland, 328
La Plata [Plata, La]
Laply'sia [Tectibranchiata]
Lapse [Legacy]
Lapwing [Plovers]
Lar, Laristan [Persia]
Larash [Marocco]
Larceny, 329
Larch Tree [Abies]
Larchér, P. H., 332
Lard [Fat]
Lardner, N., 332
Larghetto, 332
Largo, 332
Largs, 332
Láridæ, 332
Larissa [Thessaly]
Larks, 337
Larnica [Cyprus]
Lárridæ, 338
Larunda [Læmodipoda]
Larva, 338
Larvária, 339
Laryngítis [Croup]
Larynx, 339
Láscaris, C., 342
Láscaris, A. J., 342
Laser, 342
Lasiopy'ga [Pygathrix]
Lasso, Orlando di, 343
Latakía [Syria]
Latakoo, or Lætakoo, 343
Latánia, 343
Lateran, 343
Lathe [Kent]
Lathe [Turning]
Láthria [Muscicapidæ]
Latimer, Hugh, 344
Latíni, 345
Latinum Jus, 348
Latitude [Longitude and Latitude]
Latitude, Methods of Finding [Longitude and Latitude, Methods of Finding]
Látium, 349
Latreille, 350
Latrobite, 351
Latus Rectum [Ellipse; Hyperbola; Parabola]
Laud, William, 351
Laudanum [Opium]
Lauenburg, or Saxe-Lauenburg, 352
Laugharne [Caermarthenshire]
Laughter, 353
Laumonite, 353
Launceston, 353
Lauráceæ, 354
Laureate, Poet, 354
Laurine, 354
Laurus, 354
Lausanne, 355
Lausitz, or Lusatia, 355
Lava, 356
Laval, 357
Lavándula Spica, 357
Laváter, 357
Lavaur [Tarn]
Lavender, 358
Laver, 358
Lavoisier, 358
Lavóro, Terra di, 359
Law, 360
Law, John, 363
Law, William, 364
Law, Edmund, 365
Law Merchant [Lex Mercatoria]
Lawes, Henry, 365
Lawes, William, 365
Lawn, 366
Lawrence, St., river [Canada]
Lawrence, Sir Thomas, 366
Lawsónia, 367
Lay Brothers, 367
Laybach [Illyria]
Layering, 367
Lázulite, 368
Lazzaróni [Naples]
Lazzeretto, 368
Lea River [Essex; Hertfordshire]
Leach, William Elford, 368
Lead, 368
Lead, Medical Properties of, 373
Lead, Black [Plumbago]
Leaf, 374
Leaf Bud, 375
League, 375
League [Guise, Dukes of]
Leake, Admiral Sir John, 376
Leamington [Warwickshire]
Leap Year, 377
Lease, 377
Lease and Release, 378
Least Squares, Method of, 379
Leather, 379
Leaven [Bread]
Lebadæa, Livadia [Bœotia]
Lébanon [Syria]
Le Blanc [Blanc, Le]
Lebrun, Charles, 380
Lecce, 380
Lectoure [Gers]
Lecythidáceæ, 380
Ledbury [Herefordshire]
Ledoux, C. N., 381
Ledyard, John, 381
Lee, Nathaniel, 382
Leeches, 382
Leeches, Medical Use of, 383
Leeds, 384
Leek [Staffordshire]
Leer, 388
Leet, 388
Leeuwarden, 391
Legacy, 391
Legate, 392
Legend, 392
Legendre, 392
Leger Lines and Spaces, 393
Leghorn [Livorno]
Legion, 393
Legislation, 394
Legnágo [Verona]
Legrand, J. G., 396
Legúmin, 396
Leguminósæ, 396
Leibnitz, 397
Leicester [Leicestershire]
Leicester, Earl of, 400
Leicestershire, 400
Leighlin, 409
Leighton, Robert, 409
Leighton Buzzard, 409
Leiningen, 409
Leinster, 409
Leiocéphalus [Iguanidæ]
Leiolæmus [Iguanidæ]
Leiólepis [Agama, vol. i., p. 192; Iguanidæ]

VOL. XIII.
s [Iguanidæ]
, 410
inæ, 410
circle, 410
ity, 410
2
z, circle, 412
z, town, 412
county, 412
r Laylonde, John, 416
ohn, 416
homas, 416
416
Peter, 417
ake, 417
, circle, 417
, town, 417
Lippe Detmold]
418
[Muridæ]
Earth, 418
ta, 418
418
itrus]
cid of [Citric Acid]
Salt of [Oxalic Acid]
, 418
r [Siberia]
Ninon de, 420
20
stalline [Eye]
s de Calais]
cese, 423
a [Foraminifera, vol.
8]
3
, 423
I., emperors, 423
II., popes, 425
, 428
ardo, 428
ius [Allatius]
allation, 428
r, constellation, 429
29
r [Herefordshire]
mo de, 429
vince of, 429
St. [Vienne, Haute]
of Pisa, 429
429
erses, 430
Taraxacum, 430
430
, II., 435
, 437
, 437
Gulf of, 437
rripeda]
, 438
8

VOL. XIII.
Lepidodendron, 438
Lepidophyllum, 439
Lepidóptera, 439
Lepidóstrobus, 440
Lepóridæ, 440
Lepra, 442
Leprosy [Lepra]
Léptides, 442
Leptochonchus, 443
Leptophína, 443
Léptophis [Leptophina]
Leptopodíidæ [Macropodians]
Leptosómus, 444
Leptostomínæ [Indicatorinæ,
vol. xii., p. 459]
Lepus [Leporidæ]
Lepus, constellation, 444
Lérida, 444
Lerista, 445
Lernæa, 445
Leroi, J. D., 445
Leros [Archipelago, Grecian]
Lesbónax, 445
Lesbos, 445
Leghis [Georgia]
Leslie, Charles, 446
Leslie, Sir John, 446
Lessinnes, or Lessines [Hain-
Lessing, 447 [ault]
L'Estrange, 448
Lestris [Laridæ]
Le Sueur, 448
Lethargy, 448
Letter or Power of Attorney,
Letters-Patent, 449 [448
Lettuce, 449
Leucádia [Santa Maura]
Leuchtenberg, 450
Leucin, 450
Leucippus, 450
Leucíscus, 450
Leucite, 451
Leucóma, 452
Leucon [Bosporus]
Leucosians [Oxystomes]
Leuctra [Epaminondas]
Leunclávius, 452
Leusden, 452
Leuwenhoek, or Leeuwenhoek,
452
Leuze [Hainault]
Levánt, 453
Levantína, Val [Ticino]
Levelling, 453
Leven, Loch [Kinross-shire]
Lever, 454
Leveridge, Richard, 455
Levite [Jews]
Levyne, 455
Lewes, 455
Lewis, Kings of France [Louis]
Lewis [Ross-shire]
Lewisham [Kent]

VOL. XIII.
Lex [Law]
Lex Mercatória, 456
Lexicon [Dictionary]
Lexington [Massachusetts]
Leybourn, William, 456
Leycestéria, 456
Leyden, 456
Leyden Phial [Electricity]
Leyden, Lucas van, 457
Leyden, John, 457
Leyt [Philippine Islands]
Leyton [Essex]
L'Hassa [Tibet]
L'Hôpital [Hôpital]
Líalis, 457
Liamone [Corsica]
Lias, 457
Libánius, 457
Líbanus [Syria]
Libation, 458
Libau [Courland]
Libel, 458
Líber, 458
Liber Regis, 459
Libérius, 459
Libertínus, 459
Libertus [Libertinus]
Liberty, 459
Libínia, 460
Libourne, 460
Libra, 460
Library, 461
Libration, 461
Líbya [Africa]
Licentiate in Medicine, 461
Lichanótus, 461
Lichas, 462
Lichenic Acid [Malic Acid]
Lichenin, 462
Lichenópora, 462
Líchens, 462
Lichfield, 463
Lichtenberg, 463
Lichtenberg, Geo. C., 464
Lichtwer, M. G., 464
Licínius Stolo, 464
Licínius, Flávius Valérius [Con-
stantinus; Diocletianus; Ga-
lerius; Maximinus]
Lícinus, 465
Licks, 466
Lictor, 466
Licuála, 466
Liechtenstein, 466
Liege, province, 466
Liege, town, 467
Liegnitz, government, 467
Liegnitz, town, 467
Lien, 467
Lieou-Kieou Islands, 468
Lier, 469
Lieutenant, 469
Lieutenant-General [General]

VOL. XIII.
Lieutenant, Lord and Deputy
[Lord-Lieutenant]
Life, 469
Life, Mean Duration of, 470
Life Insurance, 470
Life-boat, 470
Liffy, river [Ireland; Dublin]
Lifting, 471
Ligament [Articulation]
Ligan [Flotsam]
Ligature [Hæmorrhage]
Ligature, in music, 471
Light, 472
Light, Barometrical, 477
Light-Equation, 477
Light, Chemical Agency of,
Lightfoot, John, 478 [477
Lighthouses, 478
Lightning, 478
Lights, Northern, 480
Lígia [Isopoda, vol. xiii., p. 55]
Lignin, 480
Lignite, 480
Ligulate Flowers, 480
Ligúria, 481
Ligurite, 481
Líguus, 481
Lilac [Syringa]
Liliáceæ, 481
Liliwati [Viga Ganita]
Lille, 481
Lillo, George, 482
Lilly, William, 482
Lily, William, 483
Lilybæum [Sicily]
Lima, 483
Lima (zoology) [Pectinidæ]
Limacella [Limacinea; Limax]
Limacína [Hyalæidæ]
Limacínea, 484
Limax, 484
Limb (astronomy), 488
Limbilite, 488
Limborch, 488
Limburg, 488
Lime [Calcium]
Lime, Medical Properties of,
Lime [Manure] [488
Lime Tree [Tilia]
Limerick, county, 489
Limerick, city, 493
Limerick, see, 496
Lime tone, 496
Limit; Limits, Theory of, 496
Limitations, Statute of [Statute
of Limitations]
Limma, 497
Limnáceæ [Limneans]
Limnéans, 497
Limnória, 502
Limoges, 502
Limósa [Scolopacidæ]

VOLUME XIV.

page 1
, 1
1
1
1
Lincolnshire]
ollege, 2
ire, 2
, Cape [Trondheim]
mensions [Solid, Su-
l, and Linear Dimen-
music, 19
ntrenchment, 19
[Inferobranchiata,
21 [vol. xii.]
[Foraminifera, vol.
7]

Linkoping [Sweden]
Linley, Thomas, 21
Linley, William, 21
Linlithgow, county, 21
Linlithgow, town, 22
Linnæus, 22
Linnet, 25
Linseed, 27
Linseed Oil, 27
Línthuris [Foraminifera, vol. x.,
Linúchia, 27 [p. 348]
Linum, 27
Linum Usitatíssimum, 27
Linz, 28
Lion, 28
Lip [Hare Lip]
Lípari Islands, 36
Lippe, river [Rhine]
Lippe, 36
Lípsius, 38
Lipúra, 38
Lipúrus, 38
Liquation, 38

Liquidambar, 38
Liquorice [Glycyrhiza]
Liriodendron [Tulip Tree]
Liris [Campania]
Lisbon, 38
Lisburn, 40
Liscov, C. L., 40
Lisieux, 41
Liskeard, 41
Lisle, or L'Isle [Vaucluse]
Lisle, William de, 41
Lismore, 42
Lissa, in Posen, 43
Lissa, in Prussian Silesia, 43
Lissa [Maiidæ]
List, Civil [Civil List]
Listing [Enlistment]
Litany, 43
Li-tchi, 43
Litharge [Lead]
Lithic Acid [Uric Acid]
Líthium, 43
Lithodendron 44

Lithódomus [Mytilidæ]
Lithography, 44
Lithólelaps [Cirripeda, vol. vii.
p. 208]
Lithontriptics, 46
Lithophágidæ, 46
Lithostrotion, 51
Lithótrya [Cirripeda, vol. vii.,
p. 208]
Lithótomy, 51
Lithotrity, 53
Lithuánia, 53
Litíopa, 55
Litmus, 55
Litre, 56
Littleton, Thomas, 56
Littorína [Turbinidæ]
Lituìtes, 57
Liturgy, 57
Lítuus, 58
Lituus (augural), 58
Liutprandus, 58
Livadia [Bœotia]

VOL. XIV.
Live Stock, 58
Liver, 59
Liver, Diseases of, 60
Liverpool, 61
Lívia [Augustus]
Lívius Andronícus, 64
Lívius, Titus, 64
Livónia, 66
Livóneca [Isopoda, vol. xiii., p. 52]
Livorno, 67
Livre, 68
Lixívium, 68
Lizard [Lacertiadæ; Saurians]
Lizard-Point [Cornwall]
Ljungan-Elf [Angermanland]
Ljusnan-Elf [Sweden]
Llama, 68
Llandaff [Glamorganshire]
Llandilo-Vawr [Caermarthenshire]
Llandovery [Caermarthenshire]
Llanelly [Caermarthenshire]
Llangollen [Denbighshire]
Llanos [Plains]
Llanrwst [Denbighshire]
Lo, St., 75
Loach [Cobitis]
Loadstone [Iron (Ores)]
Loam, 75
Loango, 76
Loasáceæ, 76
Lobária [Bulladæ, vol. vi., p. 11]
Lobéira, Vasco [Amadis de Gaula]
L'Obel, Matthew, 77
Lobélia Infláta, 77
Lobeliáceæ, 77
Lóbipes, 77
Lobo, Jerome, 77
Lobophy'llia, 77
Lobster [Astacus; Crustacea; Homarus]
Lobulária, 78
Locarno [Ticino]
Lochaber, 78
Loches [Indre et Loire]
Loci [Locus]
Lock, Matthew, 78
Locke, John, 78
Locked-Jaw [Tetanus]
Lockeren, 82
Locris, 82
Locus, 82
Locust, 82
Locust Tree, 83
Locusta (Crustaceology) [Palinurus]
Loddon [Berkshire]
Lodève, 83
Lodi, province, 83
Lodi, town, 83
Lofoden Islands [Trondheim]
Log and Logline, 84
Logboard and Logbook, 84
Logarithms, 84
Logarithmic Curve and Logarithmic Spiral, 87
Logic [Organon]
Logistic [Proportional]
Lógos, 87
Logwood, 88
Loheia [Arabia]
Loir et Cher, 88
Loire, river, 90
Loire, department, 91
Loire, Haute, 92
Loire, Inférieure, 94
Loiret, 96
Lokmân, 98
Lolígo [Sepiadæ; Teuthidæ]
Loligopsis [Sepiadæ; Teuthidæ]
Lólium, 98
Lollards, 99
Lomatóceras, 99
Lombard, 99
Lombardic Architecture, 99

VOL. XIV.
Lombardo-Venetian Kingdom, 100
Lombardy and Lombard Cities, 104
Lombez [Gers]
Lombhook, 108
Lomond, Loch, 108
Lomonosov, M. V., 109
Lonchéres, 109
Lonchópteris, 109
Lonchúra, 109
London, 109
London Clay, 129
London, New [Connecticut]
Londonderry, county, 129
Londonderry, city, 133
Long, Roger, 135
Long Island [New York]
Long, in music, 135
Longford, 136
Longínus, 138
Longipennes, 139
Longirostres, 139
Longitude and Latitude, 139
Longitude and Latitude, Methods of Finding, 140
Longland, 145
Longobards, 145
Longomontánus, 147
Longus, 148
Longwy [Moselle]
Lons-le-Saunier [Jura]
Loo-Choo Islands [Lieou-Kieou Islands]
Looe, East and West [Cornwall]
Loon (ornithology), 148
Lop, Lake [Turkistan]
Lope de Vega [Vega]
Lóphiadæ, 148
Lóphiodon, 148
Lophorína [Bird of Paradise, vol. iv., p. 421]
Lophóphorus [Phasianidæ]
Lóphotes, 149
Lophotus, 149
Lophúra, 149
Lophy'ropa [Branchiopoda, vol. v., p. 339]
Lóphyrus, 149
Loranthácеæ, 149
Lorca, 149
Lord-Advocate of Scotland, 149
Lord-Keeper, 150
Lord-Lieutenant, 150
Lord of Misrule, 151
Lords, House of, 151
Lordship [Leet]
Loréto, 152
Lorenzo de' Medici, 152
Loricária, 152
Loricáta, 152
Lórient, 152
Lóripes [Veneridæ]
Loris [Lemuridæ; Nycticebus; Stenops]
Lorn, 152
Lorraine, 152
Lorraine, Cardinal de [Guise]
Lory [Psittacidæ]
Löss, 154
Lostwithiel [Cornwall]
Lot, river, 154
Lot, department, 154
Lot et Garonne, 156
Lothaire [Germany]
Lotharingia [Lorraine]
Lothians, 158
Lotions, 160
Lotteries, 160
Lotus, 161
Loudéac, 162
Loudun [Vienne]
Lough Diver, 162
Loughborough [Leicestershire]
Loughrea [Galway]
Louis I.—XVIII., 162—170
Louis d'Or, 171
Louis, St. [Missouri]

VOL. XIV.
Louisbourg [Cape Breton]
Louisiade Islands, 171
Louisiana, 171
Louisville [Kentucky]
Loulé, 174
Lourdes [Pyrenées Supérieures]
Louse [Pediculus]
Louth, 175
Louth [Lincolnshire]
Loutherbourg, 178
Louvain, 178
Louviers, 179
Louvre [Paris]
Love-Apple, 179
Low Countries, 179
Lower Greensand [Cretaceous Group]
Lowth, William, 179
Lowth, Robert, 179
Loxa, 180
Loxíadæ, 180
Loxodromic Spiral, 183
Loyola [Jesuits]
Lozère, 183
Lübeck, 185
Lübeck (principality) [Oldenburg]
Lubienietski, 186
Lublin, province, 186
Lublin, town, 186
Luc, De [De Luc]
Lucánus, 187
Lucas, Paul, 187
Lucca, Duchy of, 187
Lucca, town, 188
Lucern [Luzern]
Lucern (agriculture), 188
Lucernária, 189
Lucia, St., 189
Lucian, 189
Lucian, St., 190
Lúcida, 190
Lúcifer, 190
Lucílius, 190
Lucína (conchology) [Veneridæ]
Lúcius I., II., III., 191
Lucknow, 191
Lucon [Vendée]
Luçon [Philippine Islands]
Lucretia [Brutus, M. J.]
Lucrétius, 191
Lucrine Lake [Averno]
Lucúlia, 192
Lucullus, 192
Ludlow, 192
Ludlow Rocks, 192
Ludlow, Edmund, 193
Ludolphus, 193
Lugáno [Ticino]
Lugo [Galicia]
Luke, St., 193
Luke, St., Gospel of, 194
Lulea-Elf [Bothnia]
Lully, Raymund, 194
Lully, Jean Baptiste, 195
Lumbágo [Rheumatism]
Lumbrícus, 195
Lumme, 197
Lunacy, 197
Lunar Observation, 198
Lunar Theory, 198
Lunatic [Lunacy]
Lunatic Asylums, 198
Lunation [Moon]
Lund, 199
Lundin, Sir Alan, 199
Lundy Island [Devonshire]
Lune, Lunule, 129
Lune, river [Lancashire]
Lüneburg, duchy, 199
Lüneburg, town, 200
Lunel [Hérault]
Lunette, 200
Luneville, 200
Lungs [Respiration]
Lungs, Diseases of the, 201
Lunulites [Cellariæa, vol. vi., p. 400]

VOL. XIV.
Lupa (crustaceology) [Po nidæ]
Lupinite, 202
Lupínus, 202
Lupónia [Cypræidæ, vol. vii 256]
Lupulin, 202
Lupulite, 202
Lupus, 203
Lure [Saône, Haute]
Lúridæ, 203
Lusátia [Lausitz]
Lusignan [Cyprus]
Lusitánia [Portugal]
Lustrum, 203
Lute, 203
Lutes, in chemistry, 203
Luther, 203
Luton, 207
Lutra [Otter]
Lutrária (conchology) [P ridea]
Lutrícola (conchology) [P ridea]
Lutterworth [Leicestershir
Lützen [Gustavus Adolphu
Luxembourg, 207
Luxor [Egypt; Thebes]
Luzérn, canton, 208
Luzérn, town, 209
Luzon [Philippine Islands]
Lycáon [Hyæna-Dog]
Lycaónia, 209
Lycesta, 210
Ly'cia, 210
Lycium, 210
Ly'codon, 211
Ly'copus Europæus, 211
Lycoperdon, 211
Ly'cophris [Foraminifera, v x., p. 348]
Ly'cophron, 211
Lycopodiáceæ, 212
Lycopodites, 212
Lycóris, 212
Lycurgus [Sparta]
Lycurgus, orator, 212
Lycus, river [Anatolia]
Lydford, 212
Lydgate, 213
Ly'dia, 213
Lydian Mode [Mode]
Lydus, J. L., 215
Lye, Edward, 215
Lyme Regis, 215
Lymfiord [Jutland]
Lymington, 215
Lymnea [Lymneans]
Lymnórea (zoology), 215
Lymnórea, 215
Lymph, Lymphatics, 215
Lynceus [Branchiopoda, vol. v p. 342]
Lynchburg [Virginia]
Lynn, 216
Lynx, 217
Lynx (constellation), 221
Lyon, 221
Lyon King at Arms [Herald]
Lyonais, 225
Lyónsia, 225
Lypornix, 225
Lyra (constellation), 225
Lyra (ornithology) [Mænura]
Lyre, 225
Lyric Poetry, 226
Lyrics, 227
Lyriocéphalus [Iguanidæ]
Lyrúrus [Black-Cock; Tetra onidæ]
Lys [Belgium; Schelde]
Lysander, 227
Ly'sias, 227
Lysídice, 228
Lysímachus, 228
Lysippus, 228
Ly'smata, 229
Lythráceæ, 229
Lyttelton, George, Lord, 229

M.

ıbial letter of the liquid series. For the various
e characters by which it has been denoted in the
›ean languages, see Alphabet.

ıges to which it is liable are chiefly as follows:—

interchanged with *n*. Thus *m*, at the end of
and tenses, is generally represented by an *n* in
milarly the German dative *ihm* and accusative
:en confounded in the English *him*, which is at
and accusative. So again the German *boden*,
ı, *faden*, are in English, *bottom*, *bosom*, *besom*
'athom. And even in the Greek language, not-
ıg its aversion to a final *n*, inscriptions exhibit
as *τομ βασιλεα*, *αιθηρ μεμ φσυχας*, &c., where the
lified so as to accord with the initial letter of
ıg word.

h *b*. Thus in Latin, *hiems* co-exists with *hiber-*
with *tuber*, *glomus* with *globus*, *fama* with
ıis interchange explains the form of *summus*,
:ive of *sub*, of *sumo* for *subimo*, and perhaps
or, as the comparative of *benus* or *belus*, the old
nus; whence *bene*, *bellus*, *βελτερος*, *βελτιστος*,
:c. Again, *βροτος* is equivalent to *μροτος*, and
› the Latin *mor-i* and the Sanskrit *mri*. In our
ȝe *husband* is a corruption of *houseman*, *dominus*,
ive of *housewife*.

h *p*. Hence the Greek forms *ομμα*, *τετυμμαι*,
ıa, *τετυπμαι*, &c. So the Greek preposition *μετα*
ı *πεδα*, and the Greek *μολυβδος* is in Latin

h *v*. This is particularly the case in the Welsh
Hence the name *Roman* was transferred into
with a *v* (or rather an *f*, which is pronounced
ce of the *m*; and the Latin *amnis* is believed
:al with the Welsh *Afon*, pronounced *Avon*. The
.age too has *promulgare*, apparently for *provul-*

ı *w* probably. This interchange follows easily
ıt, and is a natural step towards the next. The
! seems to be identical with our own *with*. In
ıa, 'one,' and the particle *μεν* (which also ap-
note 'one,' and so to correspond to *δε*, 'two,'
orruption of *δυο*), seem to have passed through
F*εν*, before they became *ια* and *ἰν*. Compare the
:no and the English *one* as it is pronounced.

.ppearing. This appears to have been the case
›eginning of words. See what is said above; and
: Greek *μεχρις* with *αχρις*, *μοχλιζω* with *οχλιζω*,
manus with the Teutonic *hand*, the Latin
h the English *earn*. At the end of words at
ss of an *m* is very common, particularly after *o*.
reek and Latin verb often has the first person
where analogy would lead to *om*; *scribo*, *τυπτω*.
Latin the words *sum*, *inquam*, besides the other
:bam, *scribam*, &c.; and in Greek the middle
:-αι, *τυπτεσ-αι*, *τυπτετ-αι*, which would seem to
›rmed from an old active, *τυπτομ*, *τυπτες*, *τυπτετ*,
ldition of a fixed suffix denoting *self*. In Latin
rbs ending in *o*, signifying *motion to*, appear to
m, viz. *quo*, *eo*, &c. Hence *adeo*, *quoad*, occur
.on with a preposition which elsewhere requires
'e. Again, an *m* has been lost in *posteā*, *anteā*,
.; compare *postquam*, *antequam*, &c. Lastly,
'c̄fert meā, *refert Ciceronis*, *interest meā*, &c.,
y to be explained by the full forms, *rem fert*
fert Ciceronis, *inter rem est meam*. Such a
ccords well with the phrases, *in rem meam est*,
.

e the other liquids, but not so frequently, is
ange its position with regard to the vowel of a
; in Greek the root *τεμ*, *cut*, may take the form
ϑαμα-ω has derivatives where the *μ* is next to

r M, or rather a symbol somewhat like it, for
:rn printers have found it convenient to substi-
tter, was used by the Romans to denote a thou-
; commonly said that this character was thus
se it is the initial of *mille*; but see Numerals.

MAAR, the German term for certain extinct volcanic craters, especially in the Eifel, which are filled with lakes. Others not different in origin are called See. Each term alludes to the watery expanse. Thus the Laacher See, the Maars of Daun, Ulmen, &c., are all volcanic craters, situated on eminences, but sunk so much below the level of the country as to have received the surface drainage, and to have formed a series of lakes. Those which have no apparent outlet for the waters are considered by Dr. Daubeny specially to have claims to the title of 'Maars.'

MAAS. [Rhine.]

MAASLUYS (or Maaslandsluys) is a pretty considerable town of the kingdom of the Netherlands, in the province of South Holland, about 10 miles west of Rotterdam, in 51° 55′ N. lat. and 4° 14′ E. long. It is situated on an arm of the Maas called t'Scheuer or Sluys-diep, which here empties itself into the North Sea. It has a tolerable harbour. The inhabitants, 7000 in number, are chiefly engaged in the cod and herring fisheries, the produce of which is exported in considerable quantities.

MAASTRICHT (Mastricht, or Maestricht, *Trajectum ad Mosam*), the capital of the Dutch part of the province of Limburg, is in 50° 48′ N. lat. and 5° 43′ E. long., on the banks of the Maas (or Maese), at the junction of that river with the small stream of the Jaar. It is divided by the Maas into two parts, which are connected by a handsome stone bridge 500 feet in length. The part on the right bank is properly a suburb, called Wyck. Maastricht is a pretty, regular, and well built town. It contains some large squares, such as the extensive market-place, and the parade, which is surrounded with avenues of trees. Among the public buildings the most remarkable are the very handsome townhall, with a public library, in the great market-place, and the church of St. Gervais. There are six Roman Catholic, one Lutheran, and three Calvinist churches, twenty-one churches belonging to dissolved monasteries, two hospitals, two orphan asylums, and a Lyceum. The population is 22,000 inhabitants, who have considerable manufactories of woollen cloth, flannel, leather, fire-arms, soap, and extensive breweries and distilleries. In the adjacent country they likewise cultivate madder, tobacco, and succory.

Maastricht is one of the strongest fortresses in the Netherlands, and the key to the kingdom on that side. On the west side of the Maas is St. Peter's mountain (Petersberg), upon which a citadel was erected in the year 1703. The level tract between the town and St. Peter's mountain can be laid under water by means of sluices. This mountain is very remarkable on account of its fine stone quarries, to which there is an entrance on the side next the Maas, through which waggons are driven and loaded with the blocks of stone, which they convey to the banks of the river. This quarry, extending over a tract twelve leagues in circumference, is traversed by a great number of horizontal passages, which are supported by square pillars. In various places there are openings for the admission of air and light, and small water cisterns. At one place, called the Fountain, there is a pretty large basin of water, into which a small stream flows, that issues from the foot of a fossil tree. In time of war, the inhabitants of the surrounding country, with their cattle, found a secure refuge in this quarry, which is said to be capable of receiving 40,000 persons. The passages, said to be 20,000 in number, intersect and cross each other in all directions, forming such an intricate labyrinth, that it is dangerous to venture into it without an experienced guide.

(*Beschryving van het Kon. der Nederlanden*, &c., van N. G. van Kampen; Hassel's *Handbuch*; Stein, *Geog. Lexicon*; Cannabich, *Lehrbuch*.)

MAASTRICHT ROCKS. The rock of St. Peter's mountain is generally of a granular texture, and to geological observers presents a sort of middle character between chalk and particular parts of the 'calcaire grossier' of the Paris basin. The geological relation thus suggested is confirmed by the organic remains, which, with many points of specific resemblance to the ordinary fossils of the chalk, exhibit likewise some generic relations to the Tertiary series. Accordingly, the place in the scale of strata now assigned by common consent to the Maastricht rocks is in immediate superposition above the chalk of England, and at some small interval below the calcaire grossier of Paris. It may be considered as an upper part of the chalk formation, and is paralleled by observed cases in the south-west of France. It is principally to Dr. Fitton ('Proceedings of Geol. Soc. of London,' 1829) that English geologists owe the establishment of this important classification.

St. Peter's mountain is rich in fossils, some of which lie in flint nodules, and others in the stone. A few years ago the bones of some ruminant quadrupeds were offered for sale at Maastricht, and were described as from this hill, but they did not really belong to the antient rock. The genuine remains are however very remarkable; in particular the great aquatic reptile, imagined to be a crocodile by Faujas St. Fond, but determined to have other analogies to the Lacertiadæ by Cuvier, who named it Mosasaurus: vertebræ of this animal have been found in the chalk of England and Sweden. A very large species of marine turtle (Chelonia) has also been completely examined by Cuvier from this locality. Beautiful teeth of fishes, shells of Nautili, Baculites, Belemnites, Hippurites, Inocerami, Ostreæ, Echinida, Terebratulæ, and Polypiaria may be seen in some of the interesting collections at Maastricht, and go far to prove the truth of the prevalent opinion, that the strata of St. Peter's mountain are more allied to the chalk than to the calcaire grossier—the newest of the Secondary, rather than the oldest of the Tertiary rocks.

(Dr. Fitton in *Geol. Proceedings and Transactions;* Meyer, *Palæologica;* Von Dechen, *Handbuch*, &c.)

MABILLO'N, JEAN, born in 1632, studied at the college of Rheims. He took vows in the congregation of St. Maur, belonging to the order of Benedictines, in 1654. He afterwards assisted Father D'Achery in his collection entitled 'Spicilegium,' and also edited the works of St. Bernard. In 1668 he published the first volume of his 'Acta Sanctorum Ordinis S. Benedicti,' being the Fasti of his order, preceded by a learned introduction, 'Præfationes in Acta Sanctorum.' Mabillon was afterwards sent to Italy by Louis XIV. to make a collection of books and MSS. for the royal library. On his return he published his 'Museum Italicum,' 1689, a kind of literary and antiquarian itinerary of Italy, in which he briefly describes the towns that he visited, and more at length the churches and convents, especially those of his order, such as Monte-Casino, Vallombrosa, &c., the libraries and colleges, the rare MSS., inscriptions, and other curiosities. This work is followed by learned dissertations upon subjects of ecclesiastical history and palæography. The second volume of the 'Museum Italicum' is occupied by a 'Commentarius in Ordinem Romanum,' or Commentary on the ritual of the various services, or liturgy, and ceremonies of the Roman Church, which are there exhibited at full length. He had previously published 'De Liturgia Gallicana libri tres,' 1685, in which he compares the Gallican with the Mozarabic liturgy

Mabillon wrote also the 'Iter Germanicum,' being a similar tour through part of Germany, namely, Suabia, Helvetia, and Bavaria, which he likewise undertook by order of Louis XIV. In this journey he visited the abbeys and libraries of St. Gall, Augsburg, &c., and among others the secluded Benedictine convent of Tegern See, where he and his companion met with a very scurvy reception from the librarian, a rough Bavarian, who hated them as being Frenchmen, and the more so as they caused him to be called out of the refectory to attend upon them. He also wrote an 'Iter Burgundicum,' which is among his posthumous works: 'Ouvrages Posthumes de D. Jean Mabillon et D. Thierri Ruinart, Bénédictins de la Congregation de St Maur,' 3 vols. 4to., Paris, 1724. This interesting collection contains, among other valuable matter, Mabillon's correspondence, and his 'Reflexions sur les Prisons des Ordres Religieux,' in which he censures the cruelties practised in several monastic houses against those monks who transgressed the rules of their order, and speaks among others of the famous *Vade in Pace*, or subterraneous dungeons in which some were confined till they died. This strange authority exercised by communities over the liberty and life of individuals, uncontrolled by and unknown to the state, is one of the most repulsive features of the monastic system.

In the above collection of Ouvrages posthumes are: 'Discours sur les Anciennes Sepultures de nos Rois,' 'Remarques sur les Antiquités de l'Abbaye de St. Denis,' 'Histoire de la Contestation sur l'Auteur de l'Imitation de Jesus Christ' [KEMPIS, THOMAS A], 'Lettres et Ecrits sur les Etudes Monastiques.' These last concern a curious controversy between the Abbé de Rancé, the founder of the order of the Trappists, and the Benedictines. De Rancé, in his ascetic enthusiasm, had forbidden his monks all scientific studies, and indeed all reading except the Breviary and a few monastic tracts. The rest of the clergy, both secular and regular, took the alarm, and Mabillon was requested to defend monastic studies and learning as perfectly compatible with piety and religious discipline, as the Benedictine order had fully proved. Mabillon accordingly wrote his 'Traité des Etudes Monastiques,' in 1691, which was received with great applause, and was translated into Latin and other languages. This led to a controversy with Rancé, who had the worst of it: 'Réflexions sur la Réponse de l'Abbé de la Trappe,' 1692. Another controversy which Mabillon had with Rome concerning the worship of relics of unknown persons whose bones were found in the catacombs, fills part of the posthumous works: 'Lettres et Ecrits sur le Culte des Saints inconnus.' They contain also a 'Votum D. Io. Mabillonis de quibusdam Isaacii Vossii Opusculis.' While Mabillon was at Rome, he was asked his opinion by the Congregation of the Index concerning some writings of Isaac Vossius, in which that scholar gave the preference to the chronology of the Septuagint over that of the Hebrew text, and in another place maintained that the deluge had not been universal. Mabillon said that although he believed that the opinions of Vossius, especially the latter, were not correct, yet he did not think that they constituted heterodoxy, and accordingly the Congregation did not place Vossius in the Index.

Mabillon wrote also 'De Re Diplomaticâ libri sex: accedit Commentarius de antiquis Regum Francorum Palatiis;' 'Veterum Scripturarum varia Specimina,' &c., a work much esteemed. In 1701 he was chosen member of the Academy of Inscriptions, and in 1703 he published the first volume of his 'Annales Ordinis S. Benedicti,' which he brought down to the year 1157, 6 vols. folio. He died at Paris, in 1707. Mabillon was one of the most learned men of his age, and his liberal and candid disposition is clearly exhibited in his 'Correspondence,' and in his other posthumous writings.

MABLY, ABBE' DE, born at Grenoble in 1709, studied at Lyon in the Jesuit College, and afterwards went to Paris, where he was introduced to the Cardinal de Tencin, who was then minister. He wrote in 1740 his 'Parallèle des Romains et des Français,' which acquired him a kind of popularity. He was employed by the cardinal as his secretary, and while in that office he compiled his 'Droit public de l'Europe, fondé sur les Traités,' a useful work derived from good sources. Mably was employed in several secret negotiations between 1743-6, after which he appears to have quarrelled with the cardinal, in consequence of which he gave up his official prospects for a studious retirement. His historical works are:—1. 'De la manière d'écrire l'Histoire;' 2. 'De l'étude de l'Histoire;' 3. 'Observations sur l'Histoire de la Grèce;' 4. 'Observations sur les Romains;' 5. 'Observations sur l'Histoire de France,' 2 vols. 12mo., 1765, with a posthumous continuation in two more volumes, published in 1790 (this is the best of his historical works); 6. 'Entretiens de Phocion sur le Rapport de la Morale avec la Politique.' Many of the author's views, especially in this last work, are visionary; such as a community of goods: he would also banish commerce and the fine arts from a republic. Mably was a great admirer of the institutions of Sparta. He died at Paris in 1785.

MABOU'IA, Fitzinger's name for a genus of Saurians allied to the Skinks (*Scincus*).

MABUSE, or MAUBEUGE, JOHN. This eminent painter, whose proper name was John Gossaert, was born at Maubeuge in Hainault, in 1499. Nothing is known of his parents, or of the name of the master under whom he studied. It is evident however that in early life he must have very assiduously devoted himself to the study of nature, and have acquired habits of industry. Considering that he was in after-life of a most restless ardent temperament, indulging in dissolute and licentious habits, and especially addicted to immoderate drinking, we cannot but admire the patience, fidelity, and labour which appear in his works. Most writers have affirmed that he went early to Italy, but even this is not clearly ascertained; but whatever advantage he may have derived from the study of the great masters and of the antique, he never attained the elegance of the Roman school.

After his return from Italy he lived for some time at Utrecht, in the service of the bishop, Philip of Burgundy. From Utrecht he went to Middelburg, where he painted the celebrated altarpiece, representing the Descent from the Cross, for the great church. This picture, which was of extraordinary dimensions, was highly admired by Albert Durer. The church, with this picture and all the treasures of art that it contained, was destroyed by lightning. He seems to have lived in a very extravagant manner at Middelburg, and was at last thrown into prison; but whether for debts or for some excesses is not known. It seems to have been after the recovery of his liberty that he came to London, where he was employed in the service of Henry VIII. He painted the king's children, and many portraits of the nobility, which gained him great reputation. Several of his pictures painted in England are still in existence, and others were destroyed in the fire at Whitehall Palace. One of his finest works is at Castle Howard, the seat of the earl of Carlisle. It represents the Wise Men's Offering, and is a rich composition, in which there are thirty principal figures. Dr. Waagen, in his 'Arts and Artists in England,' speaks in the highest terms of this picture, which is in as good a state of preservation as if it had been finished only yesterday. Most of the great galleries on the Continent have specimens of his works. Among these are three in he celebrated collection formed by Messrs. Boisserée, which contained above 300 pictures by the antient German masers, which they saved from neglect or destruction during he wars of the French revolution, and which are now in he possession of the king of Bavaria. These pictures are a very large and splendid composition, representing the Crucifixion, the archangel Michael overcoming Satan, and a mall highly-finished picture representing the Virgin Mary as Queen of Heaven. This is conjectured to be the picure which was most highly extolled during his lifetime, and which he painted while in the service of the marquis of Verens, a wealthy Flemish nobleman, and in which he took the marchioness and her son as models for the Virgin and Child. This nobleman having to entertain he emperor Charles V., put all the persons in his service nto new and splendid liveries, and among the rest ordered uits of rich white brocade for his painter and two others of his household. Mabuse, under some pretence, got posession of the brocade, which he sold, and spent the produce t a tavern. When the great day came, and the retainers nd servants were to pass in procession before the emperor, he dress of Mabuse appeared to be of such superior whiteness and beauty, that the emperor desired to examine it, and, to his astonishment, discovered it to be paper: thus he secret came out, and greatly amused the company. t is said that Mabuse died in 1562, but neither the place nor manner of his death is known.

Such are the particulars which we have been able to ollect of the life of this artist. Three different accounts of him now before us agree in giving the dates of 1499 and 562 as those of his birth and death. There is however one circumstance which is absolutely irreconcileable with hese dates. In the catalogue of the pictures belonging to King Charles I. is 'The children of Henry VII.: Prince Arthur, Prince Henry (afterwards Henry VIII.), and Princess Margaret.' Dr. Waagen, who saw this picture at Hampton Court, says, 'As Prince Henry, who was born in 1492, appears to be about seven years old, the picture was painted about 1499, which fixes the time when Mabuse was n England;' but 1499 was the year in which all the accounts fix the birth of the artist himself.

MACA'CO. [LEMURIDÆ, vol. xiii., p. 419.]

MACA'CUS, a barbarous word founded on the term *Macaco* (written by the French *Macaque*), which, according to Cuvier and the author of 'Natural History of Monkeys, Lemurs, and Opossums,' appears for the first time in Marcgrave's 'Nat. Hist. of Brazil,' as the native appellation of a kind of monkey found in Congo and along the coasts of the Gulf of Guinea. The author of 'The Natural History of Monkeys,' &c. observes that its application to an Asiatic species, of a genus totally distinct from that to which the animal properly bearing it really belongs, is one of the many similar errors of nomenclature committed by Buffon, at that time indeed unavoidable from the very limited knowedge which naturalists possessed on the subject of specific distinctions, and especially from the confusion which reigned in the geographical part of zoology.

Lacépède seems to have been the first who Latinized this term, and he was followed by other French zoologists as well as by those of other countries. The *Ouanderow* or *Wanderow* appears to be considered the type of the genus, at least it stands at the head of the heterogeneous species comprehended under the title.

Thus Cuvier arranges under the *Macaques* the following *Simiadæ*: *Silenus*, *Sinica*, *radiata*, *cynomolgus* and *cynocephalus*, *rhesus*, *nemestrina*, &c.

Mr. Gray arranges the genus as the last of his subfamily *Cercopithecina* (family *Hominidæ*).

M. Lesson, who makes the characters of the genus consist in a facial angle of from 40 to 45 degrees; in a very strong development of the supraciliary and occipital crests; the presence of pouches and callosities, and a tail more or less long, gives as its dental formula that which is common to so many of the *Simiadæ*, viz.:

$$\text{Incisors } \frac{4}{4};\ \text{Canines } \frac{1-1}{1-1};\ \text{Molars } \frac{5-5}{5-5} = 32:$$

and he arranges under it the following species: *Silenus*, *Sinicus*, *carbonarius*, *radiatus*, *cynomolgus*, *rhesus*, *nemestrinus*, and *speciosus*.

Sir William Jardine adopts the genus with the following species: *Macaci*, *Silenus*, *Sinicus*, *radiatus*, *cynomolgus*, *rhesus*, *nemestrinus*, and *niger*.

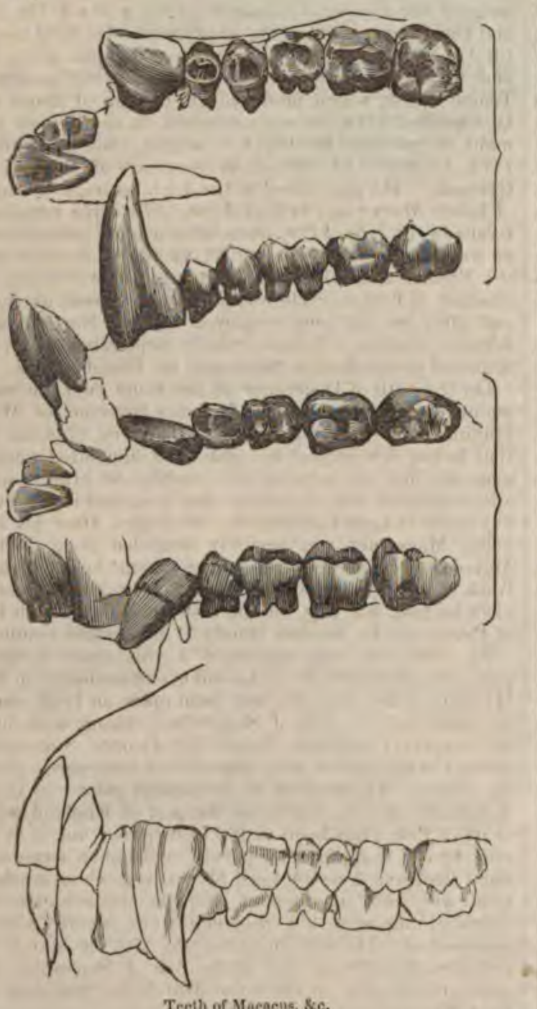
Mr. Swainson, who also adopts the genus, gives the species the English appellation of *Ape-Baboons*, and he considers that they are distinguished by an elongated muzzle, as in *Macacus carbonarius*, much more prominent than in the *Cercocebi*, and by a tail more or less lengthened: he is also of opinion that they differ from the *Cyanocephali* (Cynocephali) of Cuvier, or True Baboons, because their nostrils 'open obliquely on the upper part of the muzzle.' Mr. Swainson thinks that the form of these animals, nevertheless, shows a strong resemblance to the *Cercocebi*, which is further increased by their possessing a tail; although this member is generally so short that it seldom equals a third of the length of the body. The muzzle, he observes, is so much elongated, that the facial angle does not exceed 45°, and the canine teeth are strong and large. He further remarks that it deserves attention, that some of the species (as *M. Silenus*, *Sinicus*, and *radiatus*) are remarkable for having crests, which either assume the form of a mane or of a radiated tuft. The Chinese Bonnet Monkey has the hairs disposed in this manner, while its elongated muzzle, in Mr. Swainson's opinion, is very characteristic of the genus, and he states that the form of these animals separates them widely from the monkeys: it is, he says, strong and compact, while their disposition is cunning and mistrustful. He concludes by remarking, that the crested species inhabit India, and that the others are African. (*Nat. Hist. and Classification of Quadrupeds.*)

The author of the 'Natural History of Monkeys, Lemurs, and Opossums' rejects, for substantial reasons given in that work, the genus *Macacus*, and applies the term *Baboons*, as usually understood and applied in the English language, to a group of *Simiæ* co-ordinate with the *apes* and *monkeys*, as described by him, distinguished from the apes by the equality of their members, their cheek-pouches and ischial callosities, and from the monkeys by the short robust make of their bodies and extremities, their tubercular tails, too short to execute the functions usually assigned to that organ, and the mountain rather than sylvan habitat which this conformation necessarily induces.

'The most prominent of these traits of structure,' continues the author, 'the abbreviated or tubercular nature of the tail, is the idea usually attached to the word *baboon*, and it is certainly the most prominent and characteristic attribute of the group; since, as we have frequently had occasion to observe, the comparative development of this organ, if not the immediate cause, is at all events the most certain index of the habits and economy of these animals:' and he makes the baboons thus defined comprise two distinct genera, *Papio* and *Cynocephalus*, respectively confined, with one or two exceptions, to the continents of Asia and Africa.

The author then introduces to the reader's notice the genus *Papio* as the last and lowest of the groups which inhabit the Asiatic continent and the great islands of the Indian Archipelago, and which appear to occupy in these regions the situation which the *Cynocephali* fill in Africa. Of the forms placed by the author under this genus the *Wanderoo* and *Gelada* (*Papio Silenus* and *Papio Gelada*) are the only species in which the tail acquires any length: it never reaches, he remarks, beyond the houghs, nor is it ever employed to assist the progressive motions of the animals as among the *Cercopitheci*. These species, therefore, he thinks cannot be separated with any kind of propriety from the *Papios* with tuberculous tails, merely on account of their comparative length; because that organ, though rather more developed in the Wanderoo and Rhesus than in the Magot and Papio niger, is still greatly abbreviated as compared with the tails of the *Cercopitheci*, and entirely devoid of influence as an element in the habits and economy of animal life.

The following is given by M. F. Cuvier as the dental development of the *Macaques* and *Cynocephales*, and is taken from the Chinese Bonnet Monkey (*Macaque Bonnet Chinois*)



Teeth of Macacus, &c.

Reverting to the arrangement of the author of the *Natural History of Monkeys*, &c., we find the Papios divided into two small groups, distinguished by the greater or less length of the tail on the one hand, and its tuberculous form or total absence on the other; of the latter the well-known *Magot*, or Barbary Ape, is an example, and the Wanderoo* (*Macacus Silenus* of authors, *Papio Silenus* of the author of the *Nat. Hist. of Monkeys*), is an illustration of the former.

Description of the Wanderoo.—Hair deep black throughout, with the exception of the long beard or mane, which descends on each side of the face in the form of a ruff, extending downwards over the chest, and varying from an ash-gray to a pure white. The upper part of the face between the eyes naked and flesh-coloured; the muzzle perfectly black. Cheek-pouches large, callosities of considerable size, and flesh-coloured. Tail about half as long as the body, and when perfect, which in captivity is not often the case, terminating in a brush of tufted hairs (Bennett.)

Geographical Distribution.—Peninsula of India, Ceylon? (Knox). M. Duvaucel saw the animal in the menagerie at Barracpore, and states, according to M. F. Cuvier, that the Indians give it the name of *Nil bandar*, or perhaps, as the author of *Nat. Hist. of Monkeys* observes, more properly *nyl* or *neel bhunder*, signifying the dark blue or black bhunder; but this, continues the last-mentioned author, evidently refers merely to the colour of the hair, and can scarcely be the real appellation of the animal, which, not being a native of Bengal, is not likely to have a Bengalee name.

Habits, &c.—Father Vincent Maria gives the following quaint account of this species. 'There are found,' says the Padre, 'four sorts of monkeys on the coast of Malabar; the first is quite black with glossy hair and a white beard round the chin, measuring rather more than a palm in length. The other monkeys pay to this so profound a respect that they are humble in his presence, as though they appreciated his superiority. The princes and mighty lords hold him in much estimation for his endowments of gravity, capacity, and the appearance of wisdom above every other monkey. He is readily trained to enact a variety of ceremonies and affected courtesies, which he goes through with so grave a face, and so perfectly, that it is a most wonderful thing to see them so exactly performed by an irrational creature.'

The general posture of the species is on all fours or seated; in which positions it usually takes its food, either by the hands or by bringing the mouth to it. Its first operation in feeding is generally to fill the cheek-pouches.* It sleeps either on its side or sitting, bent forward, and with the head on the breast. Those which we have seen in captivity have exhibited varied temperaments. One in particular was all life, spirit, and mischief, while another was melancholy and staid in its deportment; and yet the health of both these animals appeared to be equally good, nor was there much difference in their ages.

Wanderoo.

MACAO, a town in China, situated at the southern extremity of the æstuary of the Choo Kiang, or Canton river, 22° 13′ N. lat. and about 113° E. long., about 80 miles from Canton by sea. It is built on a low sandy promontory, stretching southward from the island of Macao, which is separated by a narrow channel from the larger island of Kiang-shan-hien. The town extends across the central part of the peninsula from the roadstead of Macao on the east to the interior harbour on the west, and is somewhat more than half a mile wide in this direction, whilst from north-east to south-west it occupies about two miles. The streets are regular, but mostly narrow. A considerable number of houses have been built by the Portuguese and other European inhabitants in the European style, but the greater part are Chinese buildings. There are some churches and convents in the town, and also three small fortresses in the neighbourhood. A wall built by the Chinese across the isthmus is carefully guarded by them, and the Europeans are not permitted to pass it. The roadstead of Macao is much exposed to the prevalent gales during the monsoons. The interior harbour is spacious, well sheltered, and has excellent anchoring-ground; but being situated out of the route to Canton, and open only to the south-west, it cannot well be used during the south-western monsoons. For that reason it is rarely entered by vessels, which commonly lie in the harbour, called Typa Cabrado, which is formed by four small rocky islands, lying south of the southern extremity of the peninsula on which Macao is built. This harbour is not large, but as these islands are high and enclose it almost completely on all sides, it is perfectly safe, even during the heaviest gales. The entrance for vessels is from the east, but boats may pass through the northern channel direct to the town, which is only about two miles distant. About 30 miles north-east of Macao, farther up the æstuary, is the rocky island of Lintin, on the western side of which is excellent anchor-ground, where the larger vessels lie-to before they proceed to Canton, and where an extensive smuggling trade is carried on.

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* Lion-tailed Baboon of Pennant.

* 'First mouthed, last swallowed.'—HAMLET.

It is commonly supposed that the Portuguese possess the sovereignty of Macao; but that is so far from being the case, that they pay a ground-rent amounting to 500 taëls per annum, and Chinese mandarins inspect periodically the Portuguese forts, as well as levy a duty on the Macao shipping. A civil mandarin, called Tso-tang, resides within the town, as governor in the name of the emperor of China; he keeps a watchful eye on the inhabitants, and communicates information to his superiors. The only privilege which the Portuguese possess is to govern themselves; while the Chinese population of the town are entirely under the control of the mandarins. The former, including slaves, does not exceed 5000, while the Chinese are calculated to be above 30,000. Besides the Portuguese, individuals of other European nations reside in the town, especially Englishmen, who pass the summer months there, and go to Canton in autumn, when the vessels arrive.

The trade of Macao was formerly considerable, but it has been continually decreasing. The Portuguese are permitted to employ twenty-five vessels in this trade, but they actually do not possess much more than half that number. The most lucrative branch was the smuggling trade in opium, which has almost entirely passed to the island of Lintin. (Horsburgh; *The Chinese*, by Davis.)

MACARTNEY, GEORGE MACARTNEY, EARL OF, was the only surviving son of George Macartney, Esq., a gentleman of Scottish descent, but whose family had been for some generations settled on their estate of Lissanoure, near Belfast in Ireland, where the subject of the present notice was born on the 14th of May, 1737. At the age of thirteen he was admitted a fellow-commoner of Trinity College, Dublin, and in 1759, after having obtained his degree of M A., he came to London, where he entered himself of the Inner Temple, but without any intention of prosecuting the profession of the law. He then made the tour of Europe, and on his return home in 1764 it was arranged, through the interest of Lord Holland, with one of the members of whose family he had formed an intimacy on the Continent, that he should be returned to the British parliament for Midhurst, under the patronage of the earl of Sandwich, then one of the secretaries of state; but this destination was changed by his appointment, 22nd August of the same year, as envoy extraordinary to the empress of Russia, for the purpose of concluding a commercial treaty with that country. He was knighted before proceeding on this business, which, after a long and arduous negotiation, in the course of which he was not only opposed by rival interests at the court to which he was sent, but thwarted by very annoying conduct on the part of the British cabinet, he at last brought to a satisfactory conclusion. He returned to England in June, 1767, and soon after received the appointment of ambassador extraordinary and plenipotentiary to Russia, which however circumstances induced him to resign.

In February, 1768, he married Lady Jane Stuart, second daughter of the earl of Bute; and in April was returned to parliament for Cockermouth. In July following he exchanged this seat for one in the parliament of his native country, having been elected for Armagh in contemplation of his appointment to the office of chief secretary for Ireland, which took place on the 1st of January, 1769, on the nomination of Lord Townshend as lord-lieutenant, and the adoption of a new scheme of government, under which the lord-lieutenant should be, not, as heretofore, an occasional visitor only, but a permanent resident in the country.

Macartney, who was now sworn of the Irish privy-council, greatly distinguished himself by his exertions in the debates of the House of Commons against Flood, Dr. Lucas, and the other leaders of the opposition. He held his office till June, 1772, when he was made a Knight of the Bath, and in 1774 was appointed to the sinecure of governor of Toome Castle, which produced an income of above 1000*l*. In October, 1774, he was returned to the British parliament as member for the Ayr burghs; but in December, 1775, he was sent abroad as governor of the island of Granada. He was raised to the Irish peerage by the title of Baron Macartney, 10th of June, 1776. He remained in Granada till July, 1779, when after a most gallant defence he was compelled to surrender the island at discretion to the French admiral Count d'Estaing, and was himself sent prisoner to France. He was however very soon exchanged, and after having been employed by Lord North in a confidential mission to Ireland, was in September, 1780, again returned to the British parliament for Beeralstone.

On the 14th of December of the same year he was appointed by the East India Company governor of Madras. Having returned to England in January, 1786, he found that before his arrival he had been appointed governor-general; but the state of his health and other considerations induced him to decline that post, and it was eventually given to Lord Cornwallis. Very soon after his return home Macartney was severely wounded in a duel with Major-General Stuart, an officer whom he had when in India found it expedient to remove from the service. In 1788 he took his seat for the first time in the Irish House of Peers, and he resided chiefly in his native country till 1792, when he was appointed to his most memorable public employment as ambassador extraordinary to Pekin. Having on the 28th of June been made an Irish viscount, he sailed on the 26th of September, taking with him as his secretary his old friend Sir George Staunton, by whom the account of the embassy was afterwards given to the public. The amount of the benefit gained by this first diplomatic communication on the part of England with the court of Pekin has been matter of dispute; but it is generally agreed that no other person could have accomplished more than was done by Lord Macartney, whose conduct at least was well calculated to impress the subjects of the Celestial empire with a respect for the country which he represented. He left China on the 17th of March, 1794, and landed at Portsmouth on the 5th of September of the same year, having on the 1st of March previous been made Earl Macartney in the Irish peerage.

In June, 1795, he was sent on a confidential mission to Italy, from which he returned in May, 1796; and having on the 8th of June been made a British peer by the title of baron Macartney, he was in the end of the same year appointed governor of the newly captured territory of the Cape of Good Hope. Here he remained till November, 1798, when his impaired health compelled him to return to England. The same cause induced him to refuse the office of president of the Board of Control, with a seat in the cabinet, which was offered him on the formation of the Addington ministry in 1801; and he lived in retirement, suffering severely from gout, till his death, at Chiswick, 31st March, 1806. The manner in which Lord Macartney discharged his duty in the various public services in which he was employed procured him from all parties the reputation of very considerable ability and the highest honour. An account of his public life, with a selection from his unpublished writings, has appeared by Mr. (now Sir) John Barrow, in 2 vols. 4to., London, 1807, with his portrait prefixed. His writings here printed, which occupy the second volume, consist of extracts from an 'Account of the Russian Empire,' 'A Sketch of the Political History of Ireland,' and 'A Journal of his Embassy to China.' The manuscript of the 'Account of Russia' is in the king's library at the British Museum, and also a printed but not published copy of the same tract, in 8vo., dated London, 1768. The Life occupies the first four hundred and twelve pages of the first volume of Sir John Barrow's work.

M'CARTHY, SIR C. [Ashantees.]

MACASSAR. [Celebes, vol. vi., p. 400.]

MACAUCO. [Lemuridæ, vol. xiii., p. 419.]

MACAULAY, CATHARINE, was the daughter of John Sawbridge, Esq., of Ollantigh, in Kent, where she was born in 1733. She took the name by which she is best known from her first husband Dr. George Macaulay, a London physician, to whom she was married in 1760. It was soon after this date that she commenced authoress, by the publication of her 'History of England from the accession of James I. to the elevation of the House of Hanover,' the first volume of which, in 4to., appeared in 1763, and the fifth and last, which however only brought the narrative down to the Restoration, in 1771. The work also went through more than one edition in 8vo. On its first publication it attracted considerable attention, principally from the double piquancy of the sex and the avowed republicanism of the writer; but, notwithstanding some occasional liveliness of remark, and its notice of a good many facts omitted by most of our other historians, it has not been found to have merit enough to compensate for its inflamed and narrow partisanship, the loose shambling gallop of the style, and its general character of common-place and superficiality, so that it has long passed into the oblivion of waste paper. The five volumes of the History were followed, in 1778, by another, entitled 'The History of England from the Revolution to the present time, in a series of Letters to the Reverend Dr. Wilson, rector of St. Stephen's, Walbrook, and prebendary of Westminster,' 4to., Bath. The six letters of which this volume consists come down to the termination of the administration of Sir Robert Walpole, in 1742.

In 1778, or according to another account, in 1785, Mrs. Macaulay, having lost her first husband, married a Mr. Graham, of whom all that is told is that he was so many years her junior as to expose the lady to much irreverent remark. She also wrote several pamphlets, both during the progress of her great work, and after its completion. Of these the catalogue-makers have preserved the following titles:—'Remarks on Hobbes's Rudiments of Government and Society,' 1767, enlarged and republished in 1769, with the more striking title of 'Loose Remarks on some of Mr. Hobbes's Positions;' 'Observations on a Pamphlet (Burke's) entitled Thoughts on the Causes of the present Discontents,' 1770; 'An Address to the People of England, Scotland, and Ireland, on the present Important Crisis of Affairs,' 1775; 'A Treatise on the Immutability of Moral Truth,' called in a second much enlarged edition, 'Letters on Education,' 1790; and 'Observations on the Reflections of the Right Hon. E. Burke on the Revolution in France, in a Letter to the Right Hon. the Earl of Stanhope,' 1791. In 1785 she made a voyage to America to visit Washington. On her return, she retired with her husband to a small house in Leicestershire, where she died on the 22nd of June, 1791. In 1790 was printed a little volume entitled 'A Catalogue of Tracts,' which a manuscript annotation on the copy in the royal library in the British Museum states to be 'Mrs. Macaulay's,' meaning apparently the tracts in her library. The titles are between 5000 and 6000 in number, besides about 1300 sermons. Chalmers (*Biog. Dict.*) refers for further information respecting Mrs. Macaulay to the *Gentleman's Magazine*, vols. xl. and lxi.; *British Critic*, vol. iv.; Baldwin's *Literary Journal*, vol. i.; Boswell's *Life of Johnson*; and Wilkes's *Life and Letters*. There is a medallion profile of Mrs. Macaulay prefixed to the 3rd vol. of the original edition of her History, published in 1767; and the frontispiece to the volume of letters to her friend Dr. Wilson presents a monumental full-length figure of her, apparently copied from a monument which the zeal of Wilson had induced him to erect to her in his church, but which was removed by the opposite zeal of his successor in the living.

MACAW. [Psittacidæ.]

MACCABEES (οἱ Μακκαβᾶιοι), a Jewish family celebrated for their heroic resistance to the oppression of the Greek kings of Syria in the second century before the Christian æra. Their genealogy has been given under Asmonæans. Though the name Maccabees is applied to the whole family of Mattathias, and is often used even with a wider signification, it belonged properly only to Judas, the third son of Mattathias, who was surnamed Maccabæus (מַקָּבִי, *the hammerer*) on account of his prowess in war. (1 *Macc.*, ii. 4.) Others derive the name from the initial letters of the phrase מִי כָמֹכָה בָּאֵלִם יְהוָה. 'Who among the gods is like thee, O Jehovah?' (*Ex.*, xv. 11), which they suppose to have been inscribed on the banner of the Maccabees. If this were the case the Greek form would be Μαχαβᾶιοι, not Μακκαβᾶιοι.

Antiochus Epiphanes, on his return from his second campaign in Egypt, took Jerusalem by storm, polluted the Temple, carried away from it the sacred utensils and treasures, and made Philip the Phrygian governor of Judæa (B.C. 169). Two years later, after his last Egyptian expedition, he commenced a furious persecution of the Jews. Apollonius, his chief collector of tribute, was sent to Jerusalem, which he attacked and plundered, massacring many men, and making the women and children captives. He fortified Mount Sion, and placed in it a Syrian garrison. At the same time Antiochus issued an edict that all his subjects should adopt the same usages; and not content with this blow at the religion of the Jews, he sent orders forbidding them the exercise of their religious rites, and commanding them to sacrifice to idols, to profane the Sabbath, and to discontinue circumcision. Resistance to these commands was made a capital offence, and many of the Jews were put to death; while some saved themselves by fleeing into the wilderness, and others conformed to the idolatrous rites imposed upon them. The books of the law were sought for and destroyed, and whoever kept them was put to death. Jerusalem was deserted, and the Temple was polluted a second time. An old man, named Athenæus, who was sent by Antiochus to instruct the Jews in the Greek religion, placed on the great altar a smaller altar to Jupiter Olympius, which the author of the first book of Maccabees calls 'the abomination of desolation' (1 *Macc.*, i. 54), alluding, it is generally supposed, to the prophecy of Daniel (viii. 13; xi. 31; xii. 11). In consequence of this the daily sacrifice ceased on the 15th of the month Chasleu, which answered to parts of December and January, B.C. 168-7. (Clinton's *Fasti*, vol. iii., p. 321.) The officers of Antiochus were sent through the cities of Judæa to enforce the king's edict. Some of them came to Modin, where Mattathias dwelt and lamented with his five sons over the state of Israel. Upon the attempt being made to compel the people of the city to sacrifice to idols, Mattathias made an open resistance, killed a Jew who came to sacrifice, slew the king's officer, and pulled down the altar. He then fled to the mountains with his sons and their adherents. About the same time some Jews who had taken refuge in the wilderness were attacked on the Sabbath by Philip, the governor of Judæa, and massacred without resistance to the number of a thousand. In consequence of this Mattathias and his party resolved not to abstain from fighting on the Sabbath. Being now joined by the Assidæans, a sect of very strict religionists, and others, Mattathias went through the Jewish cities destroying the altars of idols, punishing the apostate Jews, and enforcing the law of Moses. In the midst of this successful course Mattathias died, having appointed his third son, Judas Maccabæus, his successor in the military command, and his second son, Simon Matthes, to be his brother's counsellor (B.C. 166). Judas pursued his father's career of victory. He defeated and slew Apollonius, the governor of Samaria; and with a small force put to flight a large army under Seron, the lieutenant of Ptolemy Macro, governor of Cœle-Syria. Antiochus now gathered an immense army, with part of which he marched against the Armenians and Persians, leaving the remainder under Lysias to act against the Jews. Judæa was presently invaded by 40,000 infantry and 7000 horse, under Ptolemy Macro, Nicanor, and Gorgias. Judas had only 6000 men; but by a skilful manœuvre he surprised the Syrians in their camp, and completely routed them. Next year he defeated an army of 60,000 foot and

5000 horse, commanded by Lysias himself, and by this victory became master of Judæa. His first care was to purify the Temple, which he did on the 15th of the month Chasleu, B.C. 165-4, exactly three years after its pollution. An annual feast of eight days was established in commemoration of this event. In the mean time Judas attacked the Syrian garrison on Mount Sion, which however he was unable to reduce, and fortified the Temple and the fortress of Bethsura, near Jerusalem. His attention was now occupied by the attacks of the neighbouring idolatrous nations, whom he and his brothers Simon and Jonathan repeatedly defeated. Enraged at these events, Antiochus marched in great haste to invade Judæa, but died on his way in the greatest agony, confessing that he suffered for his cruelty to the Jews (B.C. 164 or 3). The Jews now enjoyed a short interval of peace with Ptolemy Macro, upon whose death however the war with the neighbouring nations broke out afresh, and Judæa was once more invaded by Lysias, who had possession of the person of Antiochus Eupator, the infant son and successor of Epiphanes. Lysias was defeated, and concluded a peace with Judas. But not long after this, at the instigation of some idolatrous Jews who had escaped from the castle on Mount Sion, Lysias and the king again invaded Judæa with 100,000 foot, 20,000 horse, 32 elephants, and 300 war chariots. Before this force Judas was compelled to retreat, after fighting one great battle, in which his younger brother Eleazar Savaran died in performing an heroic action. (1 *Macc.*, vi. 43-46.) Bethsura was taken, and the Jews were closely besieged in the Temple, when Lysias was compelled, by the state of affairs in Syria, to grant them peace on favourable terms; but before leaving Jerusalem he demolished the fortifications of the Temple. Under Demetrius Soter the war was renewed at the instigation of Alcimus, who aspired to the high-priesthood. The Syrian armies sent under Bacchides and Nicanor to support his claims were defeated by Judas, and Nicanor himself was killed in battle at Capharsalama. During the short interval of peace which followed, Judas made an alliance with the Romans. But in the next year (B.C. 160) another army entered Judæa under Bacchides and Alcimus, and Judas Maccabæus fell in battle.

The Syrians were now for a time masters of the country, and Alcimus was established in the priesthood. About this time John, the eldest son of Mattathias, fell into an ambush of the enemy, and was put to death. In the following year Alcimus died in agony while engaged in violating the sanctity of the Temple; and Bacchides left Judæa, which remained in peace for two years under the government of Jonathan Apphus, the youngest of the Maccabæan family. At the end of this period another invasion of the Syrians was repelled, and Bacchides made peace with Jonathan, whose authority became fully established. The subsequent history of the Maccabees has already been given fully enough under ASMONÆANS. See also ANTIOCHUS; JEWS; JUDAS MACCABÆUS; JONATHAN APPHUS; and SIMON MATTHES.

(The 1st and 2nd books of *Maccabees*; Josephus; Jahn's *Hebrew Commonwealth;* Prideaux's *Connection;* Winer's *Biblisches Realwörterbuch.*)

MACCABEES, THE BOOKS OF THE. Five books have come down to us under this title.

1. The *First Book of the Maccabees* contains the history of the Jews during forty years, from the accession of Antiochus Epiphanes to the death of Simon Matthes, B.C. 135.

The author is unknown. Some suppose the book to have been compiled from the memoirs of the Maccabæan princes, perhaps by John Hyrcanus, about the close of whose reign internal evidence would lead us to fix its date. (1 *Macc.*, xvi. 23.) The general opinion of critics is that it was written in Hebrew. Origen and Jerome assert that they had seen the Hebrew original, and the Greek copy which we possess bears internal evidence of being translated from Hebrew. It forms part of the Septuagint, and there is an antient Latin version made from the Greek, and a Syriac version, which Michaelis supposes to have been translated from the Hebrew. This book is considered the best authority for the history of the period to which it relates.

2. The *Second Book of the Maccabees* begins with two letters which are not connected with each other, nor with the rest of the book. It then mentions some events which preceded the persecution of Antiochus Epiphanes, relates the acts of Judas Maccabæus, and concludes with the defeat of Nicanor, recorded in 1 *Macc.*, vii.

This book is abridged from an earlier work in five books, by one Jason of Cyrene. (2 *Macc.*, ii. 23-32.) The author is unknown, but from the style he is supposed to have been an Hellenistic Jew. It exists in the Greek of the Septuagint, which is considered to be the original, and there are antient versions in Syriac and Latin. Its authority is greatly inferior to that of the first book, from which it often differs.

The first and second books of Maccabees are received as canonical by the Greek and Roman churches, but not by Protestants. Josephus intimates that they were not reckoned by the Jews as inspired (*Cont. Apion.*, i., § 8), and Jerome says,—'The church does indeed read the books of the Maccabees, but does not receive them among the canonical Scriptures.' (Præfat. in *Prov. Salomonis.*)

3. The *Third Book of the Maccabees* is prior in time to the first and second, and in fact has nothing to do with the history of the Maccabees. It contains the history of the Jews at Alexandria during eight or nine years, from the battle of Raphia, in B.C. 217. The author is unknown. The Greek of the Septuagint is supposed to have been the original. There is a Syriac version in the Paris and London Polyglots, but no antient Latin version exists. Its canonical authority has been maintained by some of the fathers and by the Greek church; but the Western churches have never received it. In historical value Dr. Cotton places it above the second book, but others esteem it very lightly.

4. The *Fourth Book of the Maccabees* contains an account of the martyrdom of Eleazar and the Seven Brethren (2 *Macc.*, vi., vii.), and of the attempt of Heliodorus to plunder the temple. (2 *Macc.*, iii.) It is found in Greek in the Alexandrian and Vatican MSS., and in some editions of the Septuagint. It is generally supposed to be the same as the treatise of Josephus, 'De Maccabæis,' or 'De Imperio Rationis.' It is praised as a composition by Jerome and Augustin, but it has never been received into the canon.

5. The *Fifth Book of the Maccabees* only exists in Arabic and Syriac. Calmet supposes it to have been written in Hebrew, and thence translated into Greek. It extends from the attempt of Heliodorus to plunder the Temple to within a few years of the birth of Christ. It must have been written after the taking of Jerusalem by Titus, for it refers to that event (chaps. ix. and xxi.). The author is unknown. Some suppose it to have been compiled from the acts of the successive high-priests.

(The *Five Books of the Maccabees*, by Henry Cotton, D.C.L., Oxf., 1832; Calmet's *Dictionary* and *Dissertations;* the Introductions of De Wette, Eichhorn, Bertholdt, and Jahn.)

MACCLESFIELD, a market-town and borough, in the county palatine of Cheshire, is situated in the hundred of Macclesfield and parish of Prestbury. Under the Municipal Corporation Act it is divided into six wards, with twelve aldermen and thirty-six councillors. By the Reform Act the townships of Sutton and Hurdsfield were annexed to the parliamentary borough, which sends two members to parliament. The population of Macclesfield in 1801 was 8743; in 1811 it amounted to 12,999; in 1821 to 17,746; and in 1831 to 23,129. The number of inhabited houses in 1831 was 4543; of families, 4740, of whom 4366 were employed in trade and manufactures. Sutton contained 5856 inhabitants, and Hurdsfield 3083. The united population of Macclesfield, Sutton, and Hurdsfield was at that time 32,068, and is now computed to be 40,000. Macclesfield is 168 miles north-north-west from London, and 19 from Manchester.

The son of Henry III., as earl of Chester, made Macclesfield, in 1260, a free borough, consisting of 120 burgesses. Various advantages were afterwards granted to the burgesses by Edward III., Richard II., Edward IV., Elizabeth, and Charles II.

The town of Macclesfield is now the chief seat in the island of the silk-throwing trade, which progressively advanced from 1808 to 1825, when it attained its greatest prosperity. From this prosperity it rapidly declined, and in 1832 there were only forty-one mills at work out of seventy-two. In 1824 not fewer than 10,229 throwsters or spinners were employed: but so many were thrown out of work that the number was reduced to 3622 in 1832. This valuable trade of spinning raw silk flourished in consequence of the protection it received against the introduction of thrown silks from France and Italy. Some notion of the growth of the silk-trade in Macclesfield may be formed, when it is considered that every variety of silk article is now produced in this town, from the narrowest ribbon to the different kinds of sarsnets, plain and figured gros de Naples, satin, silk vestings, and velvets. It is likewise the chief place for the manufacture of silk handkerchiefs of every description, although it suffers from the competition of bandana handkerchiefs from India. This last circumstance, combined with the introduction of the broad silks from the Continent, has reduced wages in Macclesfield more than one-half, and occasionally involves the silk-weavers in the greatest distress

Macclesfield is situated on the west side and at the base of a range of high land which is on the borders of Cheshire and Derbyshire, and is a part of the mountain-region of the latter county. The Bollen, an affluent of the Mersey, runs through the town, the lower part of which is called the Waters. A canal which unites the Grand Trunk and Peak Forest canals passes close to Macclesfield, and thus opens a water communication with most parts of England.

Macclesfield contains four principal streets, diverging from the market-place in various directions; and there are four chief entrances from London, Chester, Manchester, and Buxton. The town-hall is a good building, designed by Goodwin, and decorated with great taste, and the public room is well adapted for concerts and meetings. A subscription library, founded in 1770, contains nearly 20,000 volumes, and is also a depository of the public records. The butchers'-market is a very neat, compact, and suitable range of buildings adjoining the general market. The court-house and gaol for the hundred of Macclesfield are also situated in the market-place. The town is supplied with water conducted in pipes from the adjoining hills, and the money paid for it goes to the borough fund. There are two fire-engines, and the town is lighted with gas. The various factories are situated on the Bollen. One of the cotton-factories cost 30,000*l*., and some of the silk factories 14,000*l*.; but the value of the latter has been much depressed by the deterioration of the silk-trade. The common at the foot of the range of hills on the east side of the town has been enclosed in consequence of an act passed for that purpose in 1791; it is now partly built upon, and the rest highly cultivated. There is an excellent steam-mill for grinding corn in this part of the town. There are two banking establishments, and a branch from the Imperial Bank of Manchester. The corn and butchers' markets take place on Tuesday and Saturday. The fairs for cattle, cloth, toys, &c., are, May 6th, June 22nd, July 11th, October 4th, and November 11.

The dispensary, erected in 1814, has one physician, three honorary surgeons, and one house-surgeon, with a salary of 100*l*. per annum. There is one savings'-bank, eight benefit societies for males, each consisting of 400 or 500 members, and four for females, of about 300 to 400 members each. There are many trusts for charitable purposes. The free grammar-school was endowed with lands in 1502 by Sir John Percyval, sometime lord-mayor of London, who is said to have been born in this city. It afterwards fell into the hands of the crown, and in April 26th, 6th of king Edward VI., a new foundation took place. The annual revenue now amounts to 1300*l*. per annum. By act of parliament (1838) four exhibitions of 50*l*. each for Oxford and Cambridge are established, and a commercial school is to be connected with the grammar-school.

St. Michael's church was founded by Eleanor, queen of Edward I., in 1278. Its architecture is partly Gothic; the chancel end, which has been rebuilt, contains a painted window representing our Saviour, the four Evangelists, and Moses delivering the Ten Commandments. There are two chapels adjoining this church; one belonged to Thomas Savage, archbishop of York, whose heart was buried here in 1508: this chapel now belongs to the marquis of Cholmondeley. The other chapel belongs to the Legh family of Lyme, one of whose ancestors, as appears from a brass plate in it, served king Edward III. and his son the Black Prince, during all their wars in France, and the estate of Lyme was given him for recovering a standard at the battle of Cressy. He afterwards served Richard II., and was beheaded at Chester. Sir Peers, the son of Perkins, served Henry V., and was slain at the battle of Agincourt.

Christ Church was built by Charles Roe, Esq., who acquired a fortune in the silk trade, and was among the first to establish it. The two churches of St. Michael and St. George have sittings for 4500. St. George's church, Sutton, and Trinity church, Hurdsfield, have 1300 seats. There are various meeting-houses belonging to the different classes of Dissenters.

A mechanics' institution was formed a few years ago by one of the principal manufacturers of this town, with the view of encouraging the efforts of some young men who had already been associated for scientific purposes. Various branches of the arts and sciences are now taught to 150 members, and the musical class has made such progress as to treat the town with a concert, which was attended by 1500 persons. When the Factory Commissioners first visited Macclesfield, a census was taken by the manufacturers of the state of education of the children in their employment, and it was found that 96 per cent. could read: the inability of the remaining four parts was accounted for by the circumstance of their belonging to families newly arrived from the country, and their wanting such dress as they thought necessary for appearing at school.

The following was the state of education as ascertained in June, 1838. The whole number of schools was 52, which contained 2109 scholars. Of this number of pupils 1106 also attend Sunday-schools; 1003 frequent only day-schools; 469 are under five years of age, 1586 between five and fifteen, and 54 above fifteen years old. The monitorial system is adopted in only two of the 38 common day-schools, which are attended by 1219 scholars. The number of Sunday-scholars amounts to 7842. Of these 149 are under five years of age, 5716 between five and fifteen, and 1977 are above fifteen. The Established Church has two Sunday-schools and 770 scholars; the union of church and Dissenters 2129, the Wesleyan Methodists three schools and 1175 scholars, Primitive Methodists 585, New Connexion Methodists 1248, Independents 871, Baptists 490, and Catholics 594. The average attendance of children on each Sunday is 5639.

(Corry's *History of Macclesfield*; Ormerod's *History of Cheshire*; Aikin's *Manchester*; *Report on the Silk Trade*, 1832; Charity Commissioners' *Report on the Grammar School*; *Population Returns*; *Communications from Macclesfield*.)

MACE, originally a club of metal, whence it derived its name of Maçe or Maçue, and whence its diminutive Mazuelle is also derived. In a more ornamental form it is used as an ensign of authority borne before magistrates.

The mace as a military weapon was peculiarly appropriated to the cavalry, and in the Bayeux tapestry several are represented in the hands of the combatants. It is not clear when the fashion of suspending them from the saddle-bow for occasional use was first introduced into Europe, but as it seems to have been borrowed from the Asiatics, we may perhaps assign it to the middle of the thirteenth century. Muratori observes that in a close conflict of cavalry it was exceedingly difficult to overthrow or wound powerful men in armour sitting on horseback, for their persons, being enveloped in hauberks, helmets, and other iron coverings, eluded the power of swords, darts, arrows, and such like weapons. For this reason it was usual to strike men so defended with iron maces, or to turn the attack on the horses, that by making them fall they might seize the rider; or if he had tumbled on the ground, the weight of his armour might render him unable to contend with any effect.

Maces seem to have been much used from the time of Edward II., both in battles and tournaments. Meyrick says all the heavy cavalry were supplied with them in the fifteenth and sixteenth centuries, though they sometimes gave way to the short battle-axe and horseman's hammer. The invention of pistols in the reign of Henry VIII. occasioned their disuse in the time of Elizabeth.

Ellis, in his notes to the 'Fabliaux,' says the mace was a common weapon with ecclesiastics, who, in consequence of their tenures, frequently took the field, but were by a canon of the church forbidden to wield the sword. Maces are still used by the Turkish horsemen. (Muratori, *Antiq. Med.*

Evi Dissert., 26; Meyrick and Skelton's *Engraved Illustr* *f antient Arms and Armour*, 4to., Lond., 1830, vol. ii., ıl. 82 and 134; Ellis's *Fabliaux*, edit. 1815, i., 190.)

The word Mace is sometimes used by our old writers in he sense of a *sceptre.*

MACE. [Myristica.]

MACER. A medicinal bark is described in antient uthors by this name. Dioscorides states that it is brought rom barbarous regions; Galen and Pliny mention it as rought from India; but all agree that it is useful in dysen- ery. C. d'Acosta describes a tree on the Malabar coast 'hich by the Brachmans is called *Macre*, of which the bark, e says, is used by them as a cure for dysentery, and that Euro- eans call it the 'arbor sancta,' and St. Thomas's tree. What ee is intended by him, his description does not enable otanists to determine, but it might probably be ascertained y those resident on the coast by comparing his description ith that of the trees indigenous or much esteemed by the atives of the Malabar coast. Avicenna gives *talisafur* as ie Arabic synonyme of *Macer*. Dr. Royle states, in his llustrations of Himalayan Botany,' p. 259, that he obtained om Caubul, under the name of *taleesfur*, leaves of a highly omatic and stimulant nature, which, having ascertained to those of a species of Rhododendron, he named *R. aro- uticum*, but the plant had been previously called *R. lepi- tum* by Dr. Wallich.

In Persian works *mafur* is given as the Greek name of *leesfur*. Transcribers no doubt have here, as in the case Lycium, changed the *k* into *f* by an error of a single int. Though the leaves do not agree with the descrip- ns of *Macer*, they may long have been substituted for em; they no doubt possess some astringent with their sti- ılant properties, and are therefore well calculated to be eful as medicinal agents.

MACEDO'NIA (Μακεδονία). The boundaries of this coun- varied at different times. In the time of Strabo, Mace- nia included a considerable part of Illyria and Thrace; t Macedonia Proper may be considered as separated from essaly on the south by the Cambunian mountains; from yria on the west by the great mountain-chain called ardus and Bernus, and which under the name of Pindus o separates Thessaly from Epirus; from Mœsia on the rth by the mountains called Orbelus and Scomius, which ı at right angles to Scardus; and from Thrace on the t by the river Strymon. The Macedonia of Herodotus s however still more limited, as is afterwards mentioned. cedonia Proper, as defined above, is watered by three ers of considerable size, the Axius, the Lydias, and the liacmon, all which flow into the Thermaic Gulf (the mo- n Gulf of Saloniki). The most easterly as well as the gest of the three, the Axius (*Vardar*), flows from the ranges ween Scardus and Orbelus, in the north-west of Macedonia, l is increased by several tributaries, and particularly the gon (*Kuchuk Karasou*), which rises in the mountains ch divide Macedonia and Illyria. The next river to the t of the Axius is the Lydias (called at the present day *a Azmac* on the coast and *Potova* in the interior), which ed, according to Strabo (vii., *Extracts*, sec. 9, vol. ii., p. , Tauchn.), from the lake on which Pella is situated. It joins the Axius about a league above the entrance of Axius into the sea. To the west of the Lydias is the iacmon (*Indje Karasou*), which flows from the Cam- ian mountains; in the time of Herodotus it joined the ias (vii., 127), but at present the Haliacmon and Ly- enter the sea by different mouths. The whole of the rict on the sea-coast, and to a considerable distance in interior, between the Axius and the Haliacmon, is very and marshy. [Axius.]

rom the mountains which divide Illyria and Macedonia mountain-ranges run towards the south-east, separating valleys of the Haliacmon, the Lydias, and the Axius: most southerly of these ranges, which is between the iacmon and Lydias, was called Bermius; and the most herly, between the Lydias and the Axius, Dysorum, in part of its course at least. The only other rivers of importance were the Strymon and the Angites, whose eys were separated from that of the Axius by a range ountains which runs from Orbelus on the north towards peninsula of Chalcidice. The Strymon (*Struma*) rises lount Scomius and flows into the Strymonic Gulf (*Gulf rphano*). Not far from the sea it forms a lake, called initis (*Kerkine*), into which the Angites flows from the ward. [Amphipolis.]

The origin and early history of the Macedonians are involved in much obscurity. Some moderns have attempted, against all probability, to derive the name from the Kittim (כִּתִּים, or כִּיתִּיִּם) mentioned in the Old Testament, (*Gen.*, x. 4; *Numb.*, xxiv. 24; *Jer.*, ii. 10; *Ezek.*, xxvii. 6; *Dan.*, xi. 30). This opinion appears to have arisen in part from the description of the country inhabited by the Kittim, which is supposed to answer to Macedonia; but still more from the fact that in the book of *Maccabees*, Alexander the Great is said to come from the land of Cheittieim (ἐκ τῆς γῆς Χεττιείμ, 1 *Macc.*, i. 1), and Perseus is called king of the Kittians (Κιττιέων, 1 *Macc.*, viii. 5).

In inquiring into the early history of the Macedonians, two questions, which are frequently confused, ought to be kept distinct, namely, the origin of the Macedonian people, and the origin of the Macedonian monarchy under the Temenidæ; for while there is abundant reason for believing that the Macedonian princes were descended from an Hellenic race, it appears probable that the Macedonians themselves were an Illyrian people, though the country must also have been inhabited in very early times by many Hellenic tribes. The Greeks themselves always regarded the Macedonians as barbarians, that is, as a people not of Hellenic origin; and the similarity of the manners and customs, as well as the languages, as far as they are known, of the early Macedonians and Illyrians, appear to establish the identity of the two nations. In the time of Herodotus, the name of *Macedonis* comprehended only the country to the south and west of the Lydias, for he observes that Macedonis was separated from Bottiæis by the united mouth of the Lydias and Haliacmon. (Herodot., vii. 127.) How far inland Herodotus conceived that Macedonia extended does not appear from his narrative. According to many antient writers, Macedonia was originally called Emathia (Plin., *H. N.*, iv. 17; Justin, vii. 1; Gell., xiv. 6); but we also find traces of the name of Macedonians from the earliest times, under the antient forms of Macetæ (Μακέται) and Macedni (Μακεδνοί). They appear to have dwelt originally in the south-western part of Macedonia near Mount Pindus. Herodotus says that the Dorians dwelling under Pindus were called Macedonians (i. 56; compare viii. 43); and although it may for many reasons be doubted whether the Macedonians had any particular connection with the Dorians, it may be inferred from the statement of Herodotus that the Macedonians once dwelt at the foot of Pindus, whence they emigrated in a north-easterly direction.

There are various accounts of the origin of the Macedonian monarchy, but all agree in asserting that the royal family was descended from the race of Temenus of Argos. (Herodot., viii. 137-139; Thucyd., ii. 99.) Perdiccas is usually regarded as the founder of this empire; the dominions of which were first confined to the country in the neighbourhood of Edessa between the Lydias and the Haliacmon, but afterwards extended as far as the Axius, and subsequently along the coast as far as the Strymon. Very little however is known of the history of the country till the reign of Amyntas I., who was king of Macedon at the time of the expulsion of the Pisistratidæ from Athens, B.C. 560. This monarch submitted to Megabyzus, who had been left in Europe by Darius after the failure of his Scythian expedition; and Macedonia was considered a province of the Persian empire till the battle of Platæa delivered it from subjection to the king of Persia.

Amyntas was succeeded by his son Alexander I., who was obliged to accompany the Persian army into Greece, but was able on several occasions to render important services to the Grecian cause. Alexander was not allowed to contend at the Olympian games until he had proved his Argive descent. (Herodot., v. 22; compare Justin, vii. 2.) The time of Alexander's death is uncertain, but he lived at least to B.C. 463, when Cimon recovered Thasos. (Plutarch, *Cimon*, c. 14.) He was succeeded by Perdiccas II., a fickle and dishonourable prince, who took an active part in the Peloponnesian war and alternately assisted Athens and Sparta as his interests or policy dictated. His successor Archelaus (B.C. 413) was the wisest monarch that had yet sat upon the throne of Macedon. He effected greater improvements in his kingdom, according to Thucydides, than all the other monarchs together who had preceded him (ii. 100). He greatly improved the condition of his army, he erected forts to repress his barbarous neighbours, constructed roads, and endeavoured to diffuse among his subjects a love of Grecian literature and refinement. He is said to have invited Socrates to settle at his court, and Euripides resided there during the latter period of his life. [ARCHELAUS.]

On the assassination of Archelaus, B.C. 399, the greatest confusion prevailed for many years; and it was not till the accession of Amyntas II. (B.C. 393), that anything like order was restored to the country. But even during the greater part of his reign Macedonia was distracted by intestine commotions and foreign enemies; and on his death, B.C. 369, the same state of confusion prevailed that had followed the death of Archelaus. Amyntas was succeeded by his eldest son, Alexander II., who was assassinated at the end of the first year of his reign by Ptolemy Alorites, who held the supreme power for three years as regent during the minority of Perdiccas; but, in consequence of abusing his trust, he was cut off by Perdiccas, B.C. 364. Perdiccas, after a reign of five years, fell in battle against the Illyrians, B.C. 359, and was succeeded by his younger brother, the celebrated Philip, who succeeded to a kingdom assailed by numerous enemies and weakened by intestine commotions, and left it, to his son Alexander the Great, the most powerful monarchy in Europe. [PHILIP; ALEXANDER.] The immediate consequences of Alexander's death are given under ANTIPATER and CASSANDER; it may be sufficient to state here, that in the commotions consequent upon that event, the royal family was finally destroyed, and Cassander obtained at first the power, and eventually the title of king of Macedon. Cassander was succeeded by his son Philip, B.C. 296, who reigned only two years; and on his death, in B.C. 294, his two younger brothers, Antipater and Alexander, having quarrelled respecting the succession, the throne was seized by Demetrius, the son of Antigonus, who reigned for seven years. He was driven from his kingdom, B.C. 287, by Pyrrhus, king of Epirus, who was however deposed in his turn, after a short reign of seven months, by Lysimachus, king of Thrace. [LYSIMACHUS.]

On the death of Lysimachus, who fell in battle, B.C. 281, the country remained in almost a state of anarchy for many years. The invasion of the Gauls from B.C. 280 to B.C. 278, and the contests between the numerous pretenders to the throne, brought the country to the brink of ruin. Eventually Antigonus (surnamed Gonnatas), the son of Demetrius, was proclaimed king; but was dethroned by Pyrrhus, who again obtained the kingdom on his return from Italy. After the death of Pyrrhus, Antigonus regained possession of the throne, which he retained till his death, B.C. 239. The two following monarchs, Demetrius II. (B.C. 239-229) and Antigonus II. (B.C. 229-220), were principally occupied in the Grecian wars which followed the formation of the Achæan league. [ANTIGONUS.]

Philip V., who succeeded Amyntas, alarmed at the increasing power of the Romans, entered into an alliance with Hannibal; but was never able to afford him any effectual assistance, in consequence of continual wars with the Ætolians and Illyrians, whom the Romans had found means to excite against him. On the conclusion of the war with Carthage, Philip found that he was unable to cope with the Roman power; and after continuing the contest for a few years, was obliged to sue for peace on such terms as the victors chose to grant. Philip was succeeded by Perseus, B.C. 178, who carried on war against the Romans, and was finally conquered, B.C. 168. [ÆMILII.] Macedonia was not immediately converted into a Roman province, but was divided into four districts, which were considered independent, and governed by their own laws, and of which the capitals were respectively—Amphipolis, Thessalonica, Pella, and Pelagonia. Macedonia was reduced to the form of a Roman province, B.C. 142.

It is very difficult to determine the boundaries of the Roman province of Macedonia. According to the 'Epitomizer' of Strabo (vii.), it was bounded by the Adriatic on the west; on the north by the mountains of Scardus, Orbelus, Rhodope, and Hæmus; on the south by the Via Egnatia; and on the east it extended as far as Cypsela and the mouth of the Hebrus. But this statement with respect to the southern boundary of Macedonia cannot be correct, since we know that the province of Macedonia was bounded on the south by that of Achæa; and although it is extremely difficult, if not impossible, to fix the precise boundaries of these provinces, yet it does not appear that Achæa extended farther north than the south of Thessaly.

Macedonia was inhabited from the earliest times by numerous tribes, whose names continued to be given till a late period to various districts of the country. The most important of these divisions were—Mygdonia, Bottiæis or Bottiæa, Pieria, Elimea, Stymphalia, Orestis, Lyncus, Eordia or Eordæa, Emathia, Pæonia, and Chalcidice.

Mygdonia, on the Thermaic Bay, was separated from the district of Bottiæis, or Bottiæa, by the Axius (Herodot., vii. 123); but its boundaries on the east are doubtful. Thucydides makes it extend as far as the Strymon (ii. 99); but this is at variance with the statement of Herodotus, who speaks of the land to the west of the Strymon under the name of Bisaltia. (Herodot., vii. 115.) Mygdonia was originally occupied by the Edones, a Thracian people, who were expelled thence by the Temenidæ. (Thucyd., ii. 99.) The principal town in this district was Therme, afterwards called Thessalonica by Cassander in honour of his wife, who was daughter of Philip. (Strabo, vii., *Excerpta*, sec. 10, vol. ii., p. 131.) It was a large and prosperous town, and exists at the present day under the name of Saloniki. The Apostle Paul addressed two epistles to the Christian converts in this town. The lake Bolbe, called at the present day Betchik, was either in or near Mygdonia (Thucyd., i. 58); it is said by Dr. Clarke to be about twelve miles in length, and six or eight in breadth.

The Bottiæis, or Bottiæa of Herodotus, was bounded on the east by the Axius, on the west by the united mouth of the Haliacmon and Lydias (vii. 127), and on the north by Emathia.* The principal town of Bottiæis was Pella, situate on the lake through which the Lydias flows, which afterwards became the residence of the kings of Macedon. Pella was a small place till the time of Philip, by whom it was greatly enlarged and beautified. (Strabo, vii., sec. 9, vol. ii., pp. 130-131.) The ruins of Pella may still be seen at Alakilisseh. Near the mouth of the Lydias was the town of Ichnæ, celebrated for an antient temple. (Herodot. vii 123; Pliny, *H. N.*, iv. 17; Mela, ii. 3; Hesych., under Ἰχναίην.) Thirty miles to the south of Pella, at the foot of Mount Bermius (Plin., *H. N.*, iv. 17), was the antient city of Berrhœa, or Berœa, which is mentioned in the *Acts of the Apostles* (xvii. 10).

Proceeding along the coast we come to Pieria. The antient district of Macedonis originally intervened between Bottiæa and Pieria. According to Strabo (vii., sec. 8, vol. ii., p. 130), and Livy (xliv. 9), Pieria was bounded on the south by Dium; but in more antient times the name was probably applied to all the country between Macedonis and the Peneus. Ptolemy calls the country between the mouth of the Lydias and that of the Peneus by the name of Pieria. Pieria was celebrated in Grecian mythology as the first seat of the muses. Pydna, the chief place in this district, also called Cydna (Steph. Byz.), and Citron, according to Strabo (vii., sec. 8, vol. ii., p. 130), known at the present day under the name of Kidros, is said to have been a Greek city, and was for some time in possession of the Athenians; but was afterwards taken by Philip and given to Olynthus. The battle between Perseus and Æmilius, which decided the fate of the Macedonian monarchy, was fought near Pydna. South of Pydna was the town of Dium, at the foot of Mount Olympus, of which Livy has given a short description (xliv. 6, 7). It afterwards became a Roman colony. (Pliny, *H. N.*, iv. 17.) Forty stadia to the north of Pydna was Methone (Strabo, vii., sec. 8, vol. ii., p. 130), at the siege of which Philip, the father of Alexander the Great, lost an eye.

In the interior, to the west of Pieria, in the valley of the Haliacmon, was the district of Elimea, the inhabitants of which were called Elimiotæ. In the time of Thucydides, Elimea was subject to the Macedonian monarchs, but was governed by its own princes (ii. 99). There was a road from Elimea to Thessaly over the Cambunian mountains (Liv., xlii. 53), and another to Ætolia (Liv., xliii. 21).

South-west of Elimea was the district of Stymphalia, which was annexed to Macedon on the conquest of Perseus by the Romans (Liv., xlv. 30), together with the country of the Atintani and Paravæi, which extended to the west of Elimea, in Illyria and Epirus.

North-west of Elimea was the district of Orestis (Polyb., xviii. 30; Liv., xxxiii. 34), which probably derived its name, as Müller has remarked, from the mountainous nature of the country (ὄρος, *mountain*), and not from Orestes, the son of Agamemnon. The Orestæ appear to have been independent of the Macedonian kings for a considerable time;

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* The Bottice of Thucydides is a different country, being a tract occupied by the Bottiæi, to the east of Potidæa and the Gulf of Therme, after they were driven out of Bottiæa. ('Journal of Education,' iv., p. 150.)

they were however obliged at length to submit to their authority, but were declared independent again on the conquest of Macedonia by the Romans. (Liv., xxxiii. 34.) The principal town in this district was Celetrum, situate on a peninsula which ran into a lake of the same name (the modern *Kastoria* or *Kesrie*).

Lyncus, the country of the Lyncestæ (Thucyd., iv. 83, 124; Liv., xxvi. 25; xxxi. 33; xxxii. 9), north of Orestis, was surrounded by mountains on all sides. It contained no towns of any importance except Heraclea, which was situate on the great Egnatian road. The Lyncestæ were governed by an independent prince of the name of Arrhibæus during the early part of the Peloponnesian war. (Thucyd., iv. 124.)

To the east of Lyncus, and north of Elimea and the Bermius, was the district of Eordia, or Eordæa, in the valley of the Lydias. The Eordians are said to have been driven out of their country, which however still continued to bear the name of Eordia by the Temenidæ, and to have settled afterwards about Physca, which was probably a town in Mygdonia. (Thucyd., ii. 99.)

Emathia, which was afterwards limited to the country north of Bottiæa, in the valley of the Lydias, was the name, as has been already remarked, by which the country was originally called, according to many antient writers. The chief town in this district, Ægæ, afterwards called Edessa (*Vodina*), was the capital of the Macedonian kingdom in the earliest times; and even when it had ceased to be the royal residence, it still continued the burial-place of the kings. It was a large city in the time of Livy (xlv. 30). It stood on the Via Egnatia, 30 miles west of Pella.

The northern part of Macedonia was inhabited by various tribes of Pæonians: of which the principal were the Pelagonians, who dwelt north of Lyncestis. The chief town of this district was also called Pelagonia. The Agrians, north-east of the Pelagonians, were a powerful Pæonian tribe, living near the sources of the Strymon (Strabo, vii., s. 18, vol. ii., p. 133.)

The peninsula south of Mygdonia, between the Thermaic and Strymonic gulfs, was called Chalcidice from the Chalcidians of Eubœa, who formed settlements in this country in very early times. The peninsula of Chalcidice comprised in the south three smaller peninsulas: Pallene, formerly called Phlegra (Strabo, vii., s. 12, vol. ii., p. 131), between the Thermaic and Toronaic gulfs; Sithonia, between the Toronaic and Singitic gulfs; and Acté, as Thucydides calls it (iv. 109), or Athos, according to Herodotus (vii. 22), between the Singitic and Strymonic gulfs. [ATHOS.] The peninsula of Chalcidice, together with the three smaller peninsulas, contained several important towns, which are frequently mentioned in Grecian history.

Potidæa, afterwards called Cassandria from Cassander, king of Macedon, founded by the Corinthians (Thucyd., i. 56), stood on the narrow isthmus which connects the peninsula of Pallene with the mainland. It sent 300 men to Platæa (Herodot., ix. 28), and after the Persian war was subject to the Athenians. Potidæa revolted from Athens, B.C. 432; and was not taken till after a siege of two years; when the Potidæans surrendered and were allowed to quit the place. A mutilated inscription in elegiac verse, now in the British Museum, commemorates the courage of those Athenians who fell in a battle before this town, B.C. 432. (*Elgin Marbles*, No. 348.) An Athenian colony was afterwards sent to occupy the town. (Thucyd., ii. 70.) It subsequently fell under the power of Philip of Macedon, and continued from that time subject to the Macedonian kings. The other towns of Pallene were Aphytis, with a celebrated temple of Bacchus; Mende, a colony of Eretria in Eubœa (Thucyd., iv. 123), which revolted from the Athenians, B.C. 423, and was retaken by Nicias and Nicostratus; and Scione, said to have been founded by the Pellenians from Achaia in Peloponnesus, which also revolted from the Athenians, B.C. 423, but was retaken, and the inhabitants treated with great cruelty; the town and lands were afterwards given to the Platæans. (Thucyd., v. 32.)

At the head of the Toronaic Gulf was the important town of Olynthus, founded by the Chalcidians and Eretrians of Eubœa. [OLYNTHUS.] The chief town in Sithonia was Torone, on the south-western coast, which was also probably founded by the Eubœans. Torone was for a long time subject to the Athenians, but afterwards belonged to the Olynthian confederacy, and was eventually united to the Macedonian monarchy by Philip.

The peninsula of Acté, or Athos, was inhabited in the time of Thucydides by a few people of Chalcidic origin, but principally by Pelasgians, Bisaltæ, Crestonians, and Edones, who dwelt in small fortified villages. (Thucyd., iv. 109.) At the extremity of this peninsula was Mount ATHOS, called at the present day *Monte Santo*. The canal of Xerxes can still be distinctly traced. Herodotus enumerates six towns within this peninsula: Sane, founded by the inhabitants of Andros (Thucyd., iv. 109); Dium, Olophyxus, Acrothoon, Thyssus, and Cleonæ. Acanthus, situate on the low flat isthmus which connects the peninsula of Acté with the mainland, was once an important town. [ATHOS.] The chief towns in the interior of the peninsula of Chalcidice were Chalcis and Apollonia, mentioned in the *Acts of the Apostles* (xvii. 1).

The Via Egnatia, which formed one great line of communication between the Ionian Sea and Byzantium, commenced at Apollonia in Illyria, and was joined at Clodiana on the Genusus by the Via Candavia, from Dyrrachium, which however is also called the Via Egnatia (Strabo, vii. § 3). The Via Egnatia entered Macedonia in the district of Lyncus, and passed by the towns of Edessa, Pella, Thessalonica, Apollonia, and Amphipolis, where it entered Thrace. [THRACE.]

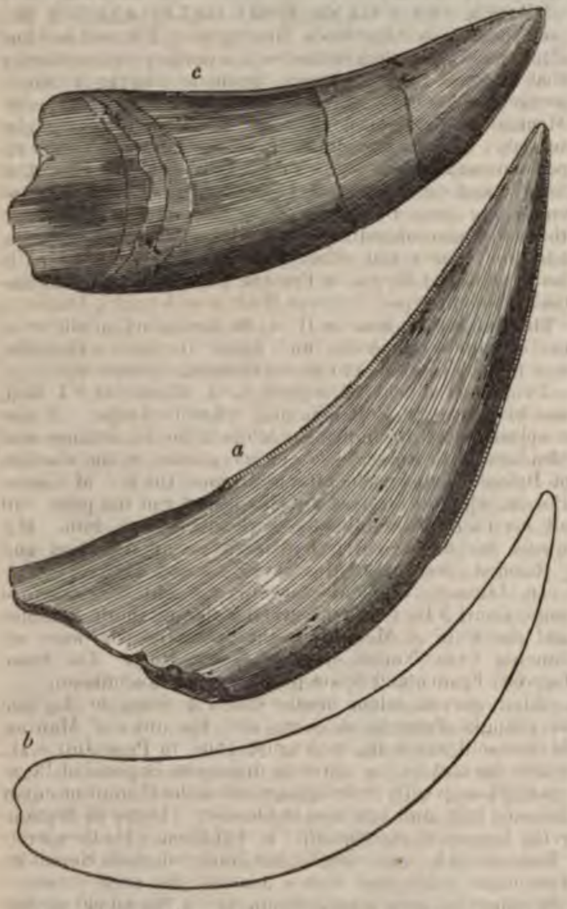
MACERA'TA E CAMERI'NO, DELEGAZIONE DI, a province of the Papal State, forming part of the old division called the Marches, is bounded on the north by the provinces of Ancona and Urbino e Pesaro, on the east by the Adriatic, on the west by the province of Perugia, and on the south by those of Spoleto and Fermo ed Ascoli. Its population amounts to 243,000 inhabitants, distributed among 12 walled towns, 48 terre with communal councils, and 235 villages and hamlets. The general inclination of the surface of the country is to the north-east, as it spreads from the foot of the central Apennine chain to the coast of the Adriatic. The principal rivers are the Potenza, Chienti, and Musone, which rise in the Apennines and flow into the Adriatic.

The principal towns are: 1, Macerata, on a hill in a fine country watered by the Chienti, a neat, well-built, cheerful town, with 15,000 inhabitants, several churches and convents with good paintings, a college, and a university, with a library containing 20,000 volumes, a court of appeal for all the provinces of the Marches, a handsome town-house, and several fine private palaces, amongst which the Palace Compagnoni is the most remarkable. Macerata is a bishop's see and the residence of the delegate. It carries on a considerable trade in corn, silk, and cattle. An annual fair for horses is held at Macerata. 2, LORETO. 3, Recanati, near the Adriatic, with 4000 inhabitants, and several churches and convents. 4, Tolentino, farther inland, near the foot of the Apennines, with 3000 inhabitants, and known in modern history for the treaty of peace of February, 1797, between General Bonaparte and Pope Pius VI.; and also for a battle on the 3rd of May, 1815, between the Austrians under General Bianchi and the Neapolitans under Joachim Murat, which by the defeat of the latter decided the fate of Naples. 5, Camerino, the antient Camerinum, an old town among the Apennines, and a bishop's see, with 7000 inhabitants, several churches and convents, and some silk manufactories. It is the birth-place of the painter Carlo Maratti. 6, Fabriano, farther north, a bishop's see, with 7000 inhabitants, manufactories of paper and parchment, and a considerable trade in wool. 7, S. Severino, with 3000 inhabitants. 8, Matelica, an old town, with 3000 inhabitants.

The province of Macerata is in part very mountainous and barren, but the valleys and plains towards the sea-coast produce abundance of corn, wine, most kinds of fruit, and very good silk. The coast along the Adriatic has no harbour which deserves the name. Recanati has a kind of port or anchoring-place for small vessels at the mouth of the river Potenza, where some trade is carried on. (Calindri's *Saggio Statistico*; Neigebaur.)

MACERATION is the exposing of any substances, and generally those of vegetable origin, when reduced to coarse powder, to the action of water or any other liquid, without the assistance of heat, in which last circumstance it differs from digestion. The object of maceration is twofold · either merely to soften the parts of the substance operated on, so as to allow of the more ready subsequent action of heat, as when cinnamon or cloves are macerated in water, previously to distillation; or it is employed to dissolve the aromatic parts of a substance, when digestion would not merely dissolve but dissipate them.

MACHA'IRODUS, a genus of extinct animals established by Professor Kaup upon those canine teeth with serrated or dentilated edges which have been attributed to bears (*Ursus cultridens*, &c.) by Cuvier and others, and to great cats (*Felis*) by Bravard. Dr. Buckland (*Bridgewater Treatise*), in his catalogue of the animal remains found in strata of sand, referrible to the second period of the tertiary formations (Miocene of Lyell), at Epplesheim near Altzey, about twelve leagues to the south of Mayence, and recorded by Kaup, includes *Machairodus*, which Dr. Buckland places between *Felis* and *Gulo*, and notes as 'allied to bear, *Ursus cultridens*.' Professor Kaup however remarks, that these 'canine teeth' and even the dentilations on their edges have a complete resemblance to those of *Megalosaurus*, and indeed their flatness and thinness do not correspond with the canine teeth of any of the existing *Carnivora*, while the dentilations strongly resemble those of the Saurian above mentioned. We here figure a tooth of *Megalosaurus*, a tooth of *Machairodus* (*Ursus cultridens*) and a cast of another, from specimens in the museum of the Geological Society of London.



a, Tooth, imperfect below, nat. size; *b*, outline of cast of tooth, perfect, ½ nat. size; *c*, tooth of Megalosaurus, nat. size.

Mr. Owen has no doubt that the teeth (*a*, *b*) belonged to a mammiferous animal, and the proof is afforded by the cast (*b*), which shows that the tooth was originally lodged in a socket, and not anchylosed to the substance of the jaw, and that the fang is contracted and solidified by the progressive diminution of a temporary formative pulp, and does not terminate in an open conical cavity like the teeth of all known Saurians, which are lodged in sockets. Careful comparison will show that the canine teeth of Machairodus are very far from those of the bears, and sufficiently removed from those of the tiger, though those of the latter present serrated edges. On looking at the catalogue of the extinct species found at Epplesheim, we do not find any large fossil ruminant noticed, though we find large cats, some as large as a lion, and another carnivorous animal (*Agnotherium*) allied to the dog and also as large as a lion · and we are not without existing ruminants with very long canine teeth in the upper jaw with serrations on their edges, though not so broad in proportion as those of *Machairodus*. [BEAR, vol. iv., p. 95.]

MACHE'TES, Cuvier's name for the Ruff (*Tringa pugnax*, Linn.). [SCOLOPACIDÆ.]

MACHIAVE'LLI, NICCOLO', was born at Florence in 1469, of an old though not wealthy family of that republic. Having received a liberal education, he was employed in the office of Marcello Adriani, chancellor of the community of Florence, and afterwards, when twenty-nine years of age, he was made secretary of the 'Ten,' a board entrusted with the management of foreign affairs and diplomatic negotiations. Machiavelli's abilities and penetration being soon perceived by his superiors, he was successively employed on many and some very important missions. The first was in 1498, to Jacopo Appiani, lord of Piombino, for the purpose of engaging him to join the Florentine troops which were besieging Pisa, whilst their general Vitelli was defending the Florentine territory against the Venetians, who, joined to the emigrant partisans of the Medici, were making incursions from the borders of Romagna. In the following year, 1799, Machiavelli was sent to Catherine Sforza, countess of Forli, in order to make arrangements with her son Ottaviano to engage as a condottiero in the service of the republic. The instructions given by the Ten to Machiavelli for each of his missions, and his letters or reports to them written during the course of his negotiations, have been published, at least in great part, and they occupy volumes iv. and v. of the 4to. edition of his works (Florence, 1782). They are most curious and valuable documents for the history of the times, and they are also most useful for the understanding of Machiavelli's political and historical works which he wrote later in life. Many letters however, and some of great importance, written to or by Machiavelli, remain still inedited. There is a collection of them in the hands of M. Salvi at Paris; three more volumes of autographs were purchased in 1826, at Florence, by Lord Guilford; and another part remains at Florence in the libraries Pitti, Rinuccini, and others. (Valéry, *Voyages en Italie;* Avenel, three articles on the French translation of the works of Machiavelli by Périès, which appeared in vols. 41 and 42 of the *Révue Encylopédique.*)

In the year 1500 Machiavelli was sent as a commissioner to the Florentine camp before Pisa. He was present at the arrival of a body of French and Swiss auxiliary troops under De Beaumont, sent by Louis XII., who had just reconquered Lombardy and had formed an alliance with Florence. Dissensions however arose between the allies concerning the pay of the auxiliaries. The Swiss mutinied, and insulted Luca degli Albizzi, one of the Florentine commissioners; and the French abandoned the attack against Pisa, throwing all the blame upon the Florentines, and took possession of Pietrasanta, of Massa and Carrara, and other districts belonging either to Florence or its allies. This was an anxious period for Florence, which saw itself entirely at the mercy of France, while it was threatened on the other side by Cesare Borgia, then the terror of central Italy, who, supported by his father Pope Alexander VI., and also by the French, was making himself master of Romagna by force or treachery, and threatening Florence, where he wished to re-establish the Medici. [BORGIA, CESARE.] In July, *1500*, Machiavelli was despatched to France in order to explain to Louis XII. the untoward occurrences at Pisa, to endeavour to keep the king, or rather his all-powerful minister Cardinal d'Amboise, archbishop of Rouen, in a friendly disposition towards Florence, and thus screen the republic from the ambition of Borgia. This was a very delicate mission. The French king and minister were prejudiced against the Florentines; they had an interest in favouring the Borgias, and they were also instigated against Florence by Trivulzio, Beaumont, and other persons of influence at the French court. Machiavelli's mission to France lasted till January, 1501. He followed the French court to Melun, Blois, Nantes, and other places, and by dint of much skilful management, of fair promises and professions, and of timely suggestions, he left Louis better disposed towards Florence than he had found him, and made him watchful and jealous of the movements of Cesare Borgia. This jealousy of the French king proved the salvation of the republic a few months after, when the ferocious and unprincipled Borgia entered Tuscany with 8000 men, and encamped a few miles from Florence The citizens showed firmness, and in the meantime letters came from the French king forbidding Borgia from molesting the republic. A convention was concluded in May, 1501, between Florence and Borgia, by which the latter, after receiving a sum of money, went his way to Piombino, and left the Florentine territory after committing many depredations. But in the following year Borgia, having returned to Romagna, drove away Guidobaldo, duke of Urbino, and took possession of Camerino, whose lord, Giulio Varano, he caused to be strangled with his three young sons, while his subordinate Vitellozzo Vitelli supported the revolt of Arezzo, Cortona, the Val di Chiana and other districts against Florence, and in favour of the Medici. Here again the French interfered, and Vitelli, who began to be alarmed at the cruelty of Borgia, entered into an agreement with the French and with Florence, by which Arezzo and other towns were restored in August, 1502. On this occasion Machiavelli, being requested by the government, wrote his opinion concerning the manner in which the revolted districts ought to be treated: 'Sul metodo di trattare i popoli di Val di Chiana.' Quoting the opinion of L. Furius Camillus after the subjugation of Latium, and the conduct of the Roman senate towards the Latin cities, he advised moderation in the present instance, except towards Arezzo, which he compared to Velitræ, and advised to be treated accordingly. (Livy, viii.)

In September of the same year, 1502, the Florentines, alarmed at the dangers by which they were encompassed, saw the necessity of giving greater stability to their executive, by appointing a gonfalonière perpetuo, a kind of dictator for life. They chose for this office Piero Soderini, a man upright and disinterested, and without children, and therefore less likely to excite suspicions or jealousy. About the same time Machiavelli was sent on a mission to Duke Valentino, the formidable Borgia, who was then at Imola in Romagna. Borgia had just returned from Lombardy, from an interview with Louis XII., in which he endeavoured to clear himself from the charge of having countenanced the insurrection against Florence, and moreover to obtain assistance from the French king for the purpose of subduing Bologna, which he intended to make the capital of his duchy.

During his absence in Lombardy, his own friends and former colleagues, Vitellozzo Vitelli, Baglioni of Perugia, the Orsini, and Oliverotto da Fermo, alarmed at the increasing ambition and cruelty of Borgia, determined to forsake him, and entered into a secret league with Bentivoglio of Bologna and Petrucci of Siena, who were his declared enemies. At the same time they invited the Florentines to join them. But as Borgia was protected by France, whose displeasure the Florentines were afraid of incurring, they sent Machiavelli to make professions of friendship to Borgia, and at the same time to watch his movements, to discover his real intentions (which was not an easy thing, for Borgia was the closest man of the age), and to obtain something in return for their friendship. The account of this mission is extremely curious: there was deep dissimulation on both sides: Borgia hated Florence as much as the Florentines hated him; but they were both kept in check by the fear of France, and both Borgia and Machiavelli made the fairest and apparently most candid professions towards each other. Borgia even assumed a confidential tone, and began to tell Machiavelli of the treachery of his former friends; he added that he knew how to deal with them, and was only waiting for his own time; he also expatiated on his well-disciplined forces, his artillery, and the assistance he expected from France; and all this in order to persuade the Florentines of the great value of his friendship, and that they should give him a condotta, that is to say, the chief command in their army. Borgia however had to do with a negotiator who, though young, was a match for him. 'I answered,' says Machiavelli, in the 21st letter of that mission, 'that his excellency the duke must not be compared to the generality of other Italian lords, but that he must be considered as a new potentate in Italy, with whom it is more fit and becoming to make a treaty of alliance than a mere condotta or mercenary convention. And I added, that as alliances are maintained by arms, which are the only binding security for either party, your lordships (the magistrates of Florence) could not see what security there would be for them if three-fourths or three-fifths of your forces were to be in the hands of the duke.' Still the negotiations went on about the condotta, whilst Borgia was meditating another stroke of his usual policy. Machiavelli had a foretaste of it at Cesena, where a certain Rimino, a confidential agent of Borgia, and, as such, hateful to the people, was suddenly arrested by order of his master, and the next morning (on the 26th of December) was found in the middle of the square cut into two pieces: 'Such,' says Machiavelli, 'has been the duke's pleasure, for he wishes to show that he can do and undo his own men as he thinks proper.' On the last day of December, Borgia, followed by Machiavelli, marched with his troops to Sinigaglia, where the Orsini, Vitellozzo, and Oliverotto were waiting for him, to have a conference and settle matters. As soon as his troops had entered the town he arrested those chiefs, strangled two of them that very night, and kept the Orsini in prison until he heard that his father, the pope, had secured the person of their relative Cardinal Orsini at Rome, after which they also were put to death. On that very night Borgia sent for Machiavelli, and said that he had done a great service to Florence in ridding the world of those men who were the sowers of discord. He then expressed his wish to attack Siena and revenge himself on Petrucci; but the Florentines, being cautioned by Machiavelli, took measures to thwart his plans, and Petrucci was saved. Machiavelli returned to Florence in January, 1503, after three eventful months passed in the court and camp of Borgia, which was the most complete school of that policy which he afterwards illustrated in his treatise 'Del Principe.' His letters (fifty-two in number) written during that mission have a certain dramatic character which awakens feelings of surprise, terror, and intense curiosity. Machiavelli wrote also a detached report of the Sinigaglia tragedy: 'Descrizione del modo tenuto dal Duca Valentino per ammazzare Vitellozzo Vitelli, Oliverotto da Fermo, il Sigr. Pagolo e il Duca di Gravina Orsini.' He obtained one thing from Borgia by this mission, a free passage through Romagna to all Florentine travellers and merchants, and their goods and other property. This document is headed 'Cæsar Borgia de Francia, Dei gratia Dux Romandiolæ, Valentiæque, Princeps Hadriæ et Venafri, Dominus Plumbini, &c., ac Sanctæ Romanæ Ecclesiæ Confalonerius et Capitaneus Generalis,' and dated 'Imolæ, 19 Octobris, A.D. 1502. Ducatus vero nostri Romandiolæ secundo.'

In August of that same year, 1503, Alexander VI. died, and his successor, Pius III., died a few days after. A new conclave being assembled in October, the Florentines sent Machiavelli to Rome, where he was present at the election of Julius II., and soon after witnessed the fall of Cesare Borgia, who was arrested at Ostia by order of the pope, and all his ill-gotten dominions were taken from him. His troops, in passing through Tuscany, were disarmed and disbanded agreeably to Machiavelli's secret advice.

In January, 1504, Machiavelli was sent to France to rouse Louis XII. to the danger threatening both Florence and the state of Milan from the Spaniards, who were advancing from Naples towards North Italy. The truce between France and Spain put an end to this mission.

After several minor missions to Piombino, to Baglioni of Perugia, Petrucci of Siena, and the duke of Mantua, Machiavelli was sent, in August, 1506, to Pope Julius II., whom he met on his march to dispossess Baglioni of Perugia and Bentivoglio of Bologna, whither the Florentine envoy followed him, and returned in October. (*Opere di Machiavelli: Legazione seconda alla Corte di Roma.*) He then wrote 'Provvisione per istituire Milizie Nazionali nella Republica Fiorentina.' He had always blamed the employment of mercenary troops and condottieri, which was an old custom of the Florentines.

In December, 1507, Machiavelli was sent to the emperor Maximilian in Germany, who had signified his intention of going to Italy to be crowned, and had demanded money of the Florentines. He proceeded by Geneva and Constance, where, finding that the emperor had moved southwards by the Tyrol, he followed him to Bolzano. The Venetians however opposed the passage of Maximilian, and Machiavelli returned to Florence in June, 1508. On his return he wrote several reports on the affairs of Germany, besides the letters which he had sent home during his mission 'Rapporto sulle cose di La Magna;' 'Discorso sopra le cose dell' Alemagna;' 'Ritratti di Lamagna.'

In February, 1509, he was sent to the camp before Pisa, which was again besieged by the Florentines, and he thence addressed a report on the state of affairs: 'Discorso fatto al Magistrato dei Dieci sulle cose di Pisa.' In June of that year Pisa surrendered, through famine

In July, 1510, Machiavelli was sent to France a third time. The Cardinal d'Amboise was lately dead. The object of this mission was to encourage the French court to maintain the alliance with the pope and the emperor against the Venetians (the league of Cambrai), and to induce Louis to prevent the Swiss from enlisting in great numbers in the service of the pope, for fear that Julius, feeling himself independent, should take some new whim into his head. And this in reality happened soon after; for, while Machiavelli was in France, Julius formed a league to drive the French out of Italy. The letters of this mission are very important. The audiences of Louis to Machiavelli, and the conferences of the latter with the cardinal of Paris, the chancellor of France, and others, and his reflections on the pope, on the projects of Louis, on the proposal made by the emperor Maximilian to Louis, of dividing Italy between them, which Louis refused to accede to, are extremely interesting. Machiavelli returned to Florence in September, 1510, having consolidated the alliance of Florence with France.

On his return he wrote his second 'Decennale,' or short chronicle, in terza rima. The first 'Decennale' went as far as 1504, after the fall of the Borgias. It thus alludes satirically to the death of Alexander VI.:—

> 'Maló Valenza; e per aver riposo
> Portato fù frà l'anime beate,
> Lo spirto d'Alessandro glorioso.
> Del qual seguirno le sante pedate
> Trè sue famigliari e care ancelle,
> Lussuria, simonia, e crudeltade.'

The second 'Decennale' comes down only to the year 1510, but Machiavelli intended to complete it till 1514. In September, 1511, he was sent again to France, concerning the council which assembled at Pisa, by order of Louis XII., to try and depose Pope Julius, which council however broke up without effecting anything. Machiavelli fell ill, and soon returned home. In 1512 the battle of Ravenna was fought, Gaston de Foix was killed, and the French lost Italy. Julius, who was irritated against Florence for having sided with the French, engaged the Spanish viceroy of Naples to send a body of troops against it, and re-establish the Medici by force. The catastrophe took place soon after.

In September, 1512, when Giuliano and Giovanni de' Medici, the sons of Lorenzo, re-entered Florence by means of the Spanish infantry, and overthrew the popular government, the gonfalonière Soderini made his escape, and the secretary Machiavelli, with others of the popular party, was dismissed from office, and banished for a time from the city. In the following year a conspiracy was discovered against the Medici, in which Machiavelli was accused of having participated; being arrested in February, 1513, he was put to the torture, which was the usual means then employed under all the governments of Florence and of Italy, of examining persons accused of state crimes. He however maintained that he had nothing to confess. From his prison of Le Stinche he wrote a sonnet to Giuliano de' Medici, who was then governor of Florence, his brother Giovanni having gone to the conclave at Rome, where he was elected pope by the name of Leo X. The sonnet, which is half sad, half humorous, describing his sufferings, his own torture, the annoyance of hearing the screams of the other prisoners, and the threats he had of being hanged, is given by Artaud in his biography, entitled 'Machiavel, son Génie et ses Erreurs,' 2 vols. 8vo., Paris, 1833.

He was soon after released, in consequence of a pardon sent from Rome by Leo X. to all those concerned in the conspiracy. Before however the pardon arrived, two of them, Pietro Boscoli and Agostino Capponi, had been executed.

Machiavelli now withdrew for several years from public life, and retired to his country-house at San Casciano, about eight miles from Florence. During this retirement he wrote his discources upon Livy, his books on the art of war, and his 'Principe.' The last work has been the subject of much controversy, which is now at an end. The book 'Del Principe,' or 'De Principatibus,' for that was the original title, was not intended for publication; it was written by the author for the private perusal first of Giuliano, and then of Lorenzo de' Medici, afterwards duke of Urbino, son of Piero and grandson of Lorenzo the Magnificent, who was appointed by Leo X. governor of Florence, his uncle Giuliano having removed to Rome.

Machiavelli, in a letter discovered only in 1810, and addressed to his friend Vettori, then at Rome, 10th December, 1513, after humorously describing his mode of life in the country, mentions this treatise on which he was then engaged, and tells him that he wishes to show to the Medici 'that he had not spent the 15 years in which he had studied the art of government in sleeping or playing, so that they might think of employing a man who had acquired experience at the expense of others;' and he adds, 'I wish that these signori Medici would employ me, were it only in rolling a stone. They ought not to doubt my fidelity. My poverty is a testimony of it.' These expressions show clearly enough that Machiavelli's object in writing the 'Principe' was to recommend himself to the Medici. All the ingenious surmises of later critics about his wishing to render absolute princes odious to the people, or to induce the Medici, by following his precepts, to render themselves insupportable and thus bring about their own fall and the restoration of the republic, are completely overthrown. Machiavelli saw clearly enough that the Medici were too firmly seated at Florence to be dislodged, and although he was himself partial to a rational system of civil liberty, if consistent with a strong government, he was still more attached to the national honour and independence of his country; and what he dreaded most was, that, through some rash ebullitions of party spirit, foreigners might be enabled to interfere and enslave Florence, as they had enslaved Lombardy and Naples. At the end of his 'Principe' (ch. xxv.) he displays this feeling with great energy. After examining the strong and the weak parts of the armies of other nations, Spanish, French, Swiss, and German, who had by turns invaded Italy, he says that it was still possible to form a native Italian army, on a new system of discipline and tactics, which might unite the advantages of each, and be able to resist them all; 'which would reflect a great credit upon a new prince, who would be looked upon as the liberator of Italy, especially by those provinces which have suffered most from foreign irruptions, and which would hail him with tears of joy and gratitude. What gates would be closed against him? what people of Italy would deny him obedience? Every one is sick of this barbarous domination. (Ad ognuno puzza questo barbaro dominio.) Let your illustrious house undertake this mission with the spirit and hope which ought to accompany just undertakings,' &c. This passage explains sufficiently that Machiavelli wrote his 'Principe' to please the Medici and to encourage them in their views of Italian dominion.

Machiavelli says, at the beginning of his treatise (ch. 2), that he does not intend to treat of republics, of which he had spoken in former works, nor of hereditary principalities, because these are by precedent and custom firm and secure; but he intends to treat of what he styles mixed principalities, that is to say, where a new ruler or prince takes possession of a country, in which he must necessarily have many enemies. He illustrates, by examples from antient and modern history, how a new ruler can secure himself in his recently acquired possessions. In the 7th chapter he gives a sketch of the method pursued by Cesare Borgia, whose political art he extols. The 8th chapter treats of those who usurp the government of their own country, and he instances Oliverotto, the petty tyrant of Fermo, who after one year of usurped power fell by the arts of a greater and more able tyrant, Cesare Borgia. The 9th chapter treats of those new princes who, without any criminal violence, but with the consent of their countrymen, have risen to the supreme power. Chapter 10 treats of the strength of the various principalities. Chapter 11 concerns ecclesiastical states, and especially that of Rome. Chapters 12, 13, 14, treat of the military force, mercenary, auxiliary, and native, showing the danger of relying upon the first two species of troops. Chapter 15 treats of the things which bring to princes praise or blame. Chapter 16, of liberality and parsimony. Chapter 17, of cruelty and clemency, and whether it is better to be loved than feared. He says the sovereign should be feared without being hated, and with this view he ought to abstain from touching the women and the property of his subjects: and he repeats, that even in cases of punishment for treason, he ought not to resort to confiscation, 'because men sooner forget the death of their father than the loss of their patrimony.' The 18th chapter, which has been considered as the most obnoxious, is in answer to the question, 'In what manner ought a prince to keep faith?' Machiavelli begins by observing that everybody knows how laudable it is for a prince to keep his faith, and to live with integrity and not to practice craft: but yet, he adds, we have seen in our own times that those princes who have cared little about faith and have known how to deceive mankind have effected great things. There are two ways of ruling, one by the laws and the other by force; the former is proper for men, the other for beasts; but as the former is not always sufficient, one must resort to the second, and adopt the ways both of the lion and of the fox. If all men were good, this lesson were not good; but as they are bad, and would not keep faith with you, you must not keep faith with them. And then he cites the example of Alexander VI., who did nothing else but deceive men, and never thought of any other means, always confirming his promises with the most solemn oaths, and always succeeding in deceiving others. In chapter 19 Machiavelli among other things praises the institutions of the kingdom of France at that time; and he approves of the parliament as a check upon the nobility. Chapter 20 speaks of fortresses, of factions, of the balance to be kept between various parties in the state. He says the best fortification for a prince is to be liked by his people. Chapter 21 is entitled, 'How is a Prince to conduct himself in order to acquire reputation?' and the author adduces the example of Ferdinand the Catholic. Chapter 22 treats of the secretaries of princes. 23, That flatterers ought to be shunned. 24, Why and how have the Italian princes lost their states? 25, That fortune has a great share in human affairs, and how we can resist its influence. 26, Exhortation to deliver Italy from the barbarians. Had Machiavelli written his book in the form of a commentary upon history, instead of adopting a didactic style, all that he says would be no more than matter of fact, for it was openly practised in his age, and had been practised long before him. Moral considerations are of course totally out of the question in such a work. But even in its didactic form, most of its precepts were not new. Gilles Colonne (Frater Ægidius Romanus), an Austin friar, preceptor to Philippe le Bel, wrote for the instruction of his pupil a treatise, 'De Regimine Principum,' afterwards printed at Venice in 1473, and translated into Spanish under the title of 'Regimiento de los Principes,' for the instruction of the Infante Don Pedro of Castile. This book was probably before the eyes of Machiavelli when he composed his 'Principe.' Several of the obnoxious principles of that treatise are also found in the 'Memoirs' of Comines, and in the 'Politic' of Aristotle.

The 'Principe' was first published, after Machiavelli's death, at Rome in 1532, with the permission of Clement VII. The 'Legazioni,' or letters of the political missions of Machiavelli, which are the key to his 'Principe,' were not made public till the middle of the last century.

In 1516 Machiavelli wrote his 'Discorsi sulla prima Deca di Tito Livio,' or commentary on the first ten books of Livy, which are still much admired. Ater the death of Lorenzo de' Medici, in 1519, Cardinal Giulio having become governor of Florence, both he and Leo X. seem to have remembered Machiavelli, and it was at Leo's request that he wrote a 'Discorso sopra Riformare lo stato di Firenze,' which was a plan of a new constitution for that state.

After 1521 Machiavelli was again employed on various missions. He was sent once to Venice, in 1525, and several times to his friend Guicciardini, who was governor, first of Modena, and then of Parma, for the pope. This was the time when Pope Clement VII. and the French were allied against Charles V., and when the Imperial army under Bourbon was threatening to cross the Apennines, no one knew whether to fall upon Tuscany or upon Rome. Machiavelli was sent to Parma to spy their motions. He returned to Florence in May, 1527, after Bourbon's army had gone to Rome. Being unwell in the stomach, he took some medicine of his own, upon which he grew worse, and died, after receiving the sacrament, on the 22nd June, at the age of fifty-eight. A letter of one of his sons describes the particulars of his death. He left five children by his wife Marietta Corsini, but little or no fortune. He was buried in the family vault in the church of Santa Croce; but it was only in 1787 that a monument was raised to his memory, through the exertions and liberality of Earl Cowper.

The other works of Machiavelli, not mentioned above, are:—'Storie Fiorentine,' which he presented to Clement VII. in 1525, and which come down to the death of Lorenzo the Magnificent, in 1492. They rank among the best works on Italian history. The style of Machiavelli is remarkably nervous, concise, and comprehensive, and very different from that of his contemporary (and, it may be said, continuator) Guicciardini. Machiavelli has left fragments which bring down the history of Florence to 1499. 2. 'La Mandragora,' and 'La Clizia,' two comedies; 3. 'L'Asino d'Oro,' an imitation of the 'Golden Ass' of Apuleius; 4. 'Vita di Castruccio Castracani,' incomplete; 5. 'Sommario delle cose di Lucca,' which is a political and statistical account of that republic; 6. 'Sette libri dell' Arte della Guerra,' which were highly esteemed by Frederick the Great of Prussia and other competent judges; 7. 'Discorso se la Lingua di Dante, Boccaccio, e Petrarca, debba chiamarsi Italiana, Toscana, o Fiorentina;' besides minor productions and a multitude of letters. The best editions of his works collectively are those of Florence, 1783, 6 vols. 4to.; 1796, 8 vols. 8vo.; and 1818, 10 vols. 8vo.

MACHICOLATION. [GOTHIC ARCHITECTURE, p. 321.] This term, which is obviously enough from the two French words *mèches* and *couler*, afterwards compounded into the barbarously Latinized one *muschicolatum* or *macchicolatum*, was significantly bestowed on those openings in the parapet of a fortified building through which ignited combustibles (*mèches*), or melted lead, stones, &c., were poured and hurled down upon the besiegers. The apertures were formed in the soffit or under surface of the projecting parapet, which was supported upon corbel stones, the perforations themselves being in the soffit, between those stones. By this ingenious contrivance the besieged were enabled to harass their assailants in a most formidable manner, while they themselves were protected by the parapet and its battlements. Machicolations were, as frequently as not, confined to particular situations, such as over an entrance gateway and the towers flanking it, or other parts most likely to be assaulted. In antient castellated structures the hanging parapet and machicolations contribute very much both to expression and architectural effect; but in modern buildings affecting the same style, although eminently characteristic of it, they are palpable incongruities in themselves, not so much because unmeaning, as because they carry along with them a false meaning.

MACHIN, JOHN, succeeded Dr. Torriano as professor of astronomy to Gresham College, 16th May, 1713. His death is announced in the 'Gentleman's Magazine,' 7th June, 1751, but the date of his birth is unknown. He is the author of a method for determining the quadrature of the circle, by means of the known development of an arc according to the ascending powers of its tangent, which he so modified as to render rapidly convergent. It was however by means of Dr. Halley's method that he computed the ratio of the circumference of the circle to its diameter as far as one hundred places of decimals. In the 'Philosophical Transactions' he wrote: 1, A paper 'On the Curve of quickest Descent,' xxx., 1718; 2, 'A Case of distempered Skin,' xxxvii., 1732; 3, 'Solution of Kepler's Problem,' xl., 1738. Besides the above, he published a pamphlet on the 'Laws of the Moon's Motion according to Gravity,' which was printed at the end of Motte's Translation of Newton's 'Principia,' 8vo., 1729.

(Hutton's *Tracts*, vol. i.; *Philosophical Trans.*, &c.)

MACHINE, an object by the intervention of which a motive power is made to act upon any body and overcome the force by which the latter resists the effort to change its state of rest or motion. A machine differs in no respect from a tool, an instrument, or an engine, and any one of these terms might be used indifferently for the same thing: the word tool is however generally applied to an object containing in its construction some mechanical power, and which, when in use, is held in the hand of the operator.

The advantage which any machine affords for overcoming resistance, consists in the reaction by which it supports a certain portion of the weight producing that resistance, so that the motive power has only to counteract the remainder. This may be immediately observed in those simple machines called the mechanical powers. For example; in the lever, the wheel and axle, and the pulley, whose properties depend on the theory of parallel forces (when, consequently, of the resistance, the moving power, and the reaction of the machine, some one is equal to the sum of the two others), any convenient portion of the resistance may be made to rest on the point of support, or the point of suspension

Again; in the inclined plane, the wedge, and the screw, whose properties depend on the theory of forces concurring in a point, the motive power, the resistance, and the reaction of the support, are represented by the three sides of a triangle; and the ratio of the first to either of the others may be varied at pleasure by the construction of the machine.

The powers employed to give motion, through machinery, to any object, are produced by the muscular strength of men or animals; the actions of weights, springs, wind, water, steam, or fired gunpowder; and these powers may generally be considered as pressures exerted during certain portions of time. Even that power which is produced by a sudden impulse, as when a rammer descending by its weight falls on the head of a pile, is only a pressure existing during an indefinitely short interval of time. The point in any machine to which the moving power is applied is called the impelled, and that against which the resistance acts is called the working point.

In the employment of any machine a certain portion of the power is expended in overcoming the inertia and friction of the materials, and that which remains is the only efficient force by which the useful effect is to be obtained. Thus, in pushing or drawing a body up an inclined plane, the effective motive power is less than that which is actually expended by as much as is necessary to overcome the inertia of the body and its friction on the plane; and these might be avoided if it were possible or convenient to raise the body vertically to an equal height by the descent of a body of greater weight, when both are connected together by a string passing over a pulley. The loss of power from inertia is doubled when a reciprocating motion exists in the same machine; for a momentary state of rest takes place between every two contrary directions of the movement, and immediately afterwards a new inertia is to be overcome. The retarding forces above mentioned are evidently greater as the quantity of machinery in an engine is augmented; and hence every machine should be as simple as possible consistently with the requisite relation between the moving power and the opposing resistance.

In the construction of machinery it is evident that all abrupt variations of velocity should be prevented, on account of the irregularity which they induce in the action. When, for example, one wheel drives another by means of the teeth on their circumference, the pressure of the teeth takes place wholly on one side of the latter, and the movement may be steady if the teeth are well formed; but on a sudden diminution of the velocity of the driving wheel, that which is driven, continuing for a time to move with its actual velocity, tends further to retard the movement of the other, and the pressure of the teeth against each other takes place on the opposite side. Thus a shaking motion is produced which diminishes the efficacy of the machine. The disadvantage attending such variations in the movement of the machinery renders it advisable to gain the required effect by continued pressure, if possible, rather than by the employment of percussive forces.

It is also a maxim assented to by engineers that the impelled point of a machine should not be allowed to move with a greater velocity than that with which the motive power can act upon it; since in this case the excess of velocity in the machine will be employed in accelerating the motion of the power, and thus the general acceleration of the machine will suffer a corresponding diminution. The velocities of the impelled and working points should therefore be properly adjusted to the pressures, the inertia, and the friction, in order that all possible advantage may be derived from the machine.

A just estimate of the power of a machine ought to include the effects of all the momentary accelerations and retardations of motion to which it is subject, and all the losses arising from inertia and friction; but as the introduction of these circumstances would excessively complicate the investigation, it is usual to make the measure of the power depend on the condition that the impelled and working points shall be in a state of uniform motion. For then, agreeably to the property of the simple lever, the velocities of those extreme points will be inversely proportional to the forces which would be in equilibrio at the same points; and the rule propounded by Euler is, that in every machine, simple or complex, the pressure at the impelled point, multiplied by the velocity of that point, is equal to the product of the resistance at the working point by the velocity of the same point; or the momentum of resistance (commonly called the *performance* of the machine) is equal to the momentum of impulse. Whatever objection may be made to this rule with respect to the measure of the power in action, no doubt can exist that it affords a correct value of the useful effect; and the latter may therefore be measured by the weight which might be raised by the machine to a given height vertically in a given time. The fact is sufficiently evident when a mass of any material is to be conveyed from one place to another, or when a body is let fall on any object from a given height. It follows that, if an algebraical expression be obtained for the momentum of the resistance in terms involving that resistance, the motive power and the distances of their points of application from the axis of motion; on making the differential of that expression equal to zero, the ratio of the resistance to the moving power, when the useful effect of the machine is a maximum, may be found from the resulting equation.

If M represent the mass of any body moved, W its weight, which is equal to Mg, g ($=32\frac{1}{6}$ feet) expressing the force of gravity; also, if H be the height to which the body may be raised in one second of time, and V the velocity which a body would acquire by falling vertically through a height equal to H, we shall have, by the theory of motions, $V^2=2gH$; whence $W.H$ (the momentum of resistance, or the useful effect of a machine) $=\frac{1}{2}MV^2$. This last expression is designated the living, or active, force of the body moved; and it expresses the force of a body in motion, in contradistinction to the simple pressure exercised by a body at rest.

It is commonly asserted, that, in the employment of machinery, as much is lost in time as is gained in power, or that the momentum of resistance is proportional to the power employed; but this rule requires some modification. It can be shown to hold good in a well-constructed machine when the object moved resists by its inertia only; but if the inertia is but a small part of the resistance, the momentum of the latter, or the work done, is found to increase nearly as the square of the power employed.

The various ingenious contrivances which have been adopted in machines for regulating the velocities, and for converting one species of motion into another, are noticed in the article WHEELS.

Descriptions of the several mills, engines, and machines used in manufactures and the arts will be found in Robison's 'Mechanical Philosophy,' in Gregory's 'Mechanics,' and under the word Manufactures in the 'Encyclopædia Metropolitana.'

MACKENZIE, SIR GEORGE, of Rosehaugh, son of Simon Mackenzie (brother of the earl of Seaforth) by a daughter of Dr. Bruce, principal of St. Leonard's College, St. Andrew's, was born at Dundee in 1636, and having finished his grammar education, which he did with much applause, he proceeded to Bourges, 'the Athens of Scottish lawyers,' as he calls it, to study the civil law. On his return he passed advocate, January, 1659, being then about 23 years old. The next year he published his 'Aretina, or the Serious Romance,' where, says Ruddeman, he gives 'a very bright specimen of his gay and exuberant genius.' The year following we find him in the important situation of justice-depute, an office in the nature of an English justice in eyre, or of assize; and in that character appointed to repair with his colleagues 'once a week at least to Musselburgh and Dalkeith, and to try and judge such persons as were there or thereabout accused of witchcraft.' Not many years afterwards, though at what time is not quite certain, he had the honour of knighthood. In the meantime he continued his literary labours. In 1663 his 'Religio Laici, or Short Discourse upon several Divine and Moral Subjects,' appeared; two years afterwards, his 'Moral Essay upon Solitude,' in which he exalts that state above public employment with all its advantages; and in 1667, his 'Moral Gallantry,' a treatise in which he attempts to establish the moral duties on the principles of honour. It was shortly after this time he entered parliament, representing the county of Ross, where the influence of his family was powerful and extensive; and in 1674 he was appointed king's advocate in the room of Sir John Nisbet of Dirleton. He continued in the office till the accession of King James, when it was given to Sir John Dalrymple; but in a short time he was reinstated and continued in office till the Revolution. Previous to this last event he had published several of his legal works, and had been instrumental in founding the *Advocates' Library*. It was in 1682 that this library was founded; and at its foundation he delivered an inaugurate oration setting forth its advantages. In 1678 he published his 'Discourse on the Laws and Customs of Scotland in Matters Criminal.' In 1684 he published his 'Institutions of the Laws of Scotland,' a concise and, generally speaking, excellent compendium of the law; and in 1686 he published his 'Observations on the Scotch Acts.' He seems also to have attempted the establishment of a chair of law in the University of Edinburgh, but was unsuccessful in obtaining that object.

After the Revolution Sir George retired to Oxford, where he was admitted a student on the 2nd of June, 1690; but he did not live long afterwards to enjoy the retirement which he had early praised and had now begun to experience. He died on the 2nd of May, 1691; and after lying several days in state in the abbey of Holyrood House, Edinburgh, his body was conveyed to Greyfriars church-yard, attended by a procession consisting of the council, the nobility, the college of justice, the college of physicians, the university, the clergy, and many others.

Sir George was the correspondent of Dryden and other writers of England; and he was among the first Scotchmen who wrote the English language in a style approaching to purity. But it was as a lawyer, and still more as an officer of state, that he was principally distinguished; and in this last character he received the appellation, which will live with his name, of 'The blood-thirsty Advocate.'

MACKENZIE, SIR ALEXANDER, is said to have been a native of Inverness in Scotland, from which he emigrated to Canada when a young man, and there obtained a situation in the counting-house of Mr. Gregory, one of the partners of the North-West Fur Company. He had resided for about eight years in the service of Mr Gregory at Fort Chipewyan, at the head of the Athabasca lake, in the savage country to the west of Hudson's Bay, when the knowledge he had acquired of the country and the people, and his intelligence and enterprising character, determined his employers to send him out on an exploring expedition through the regions lying to the north-west of that station, and conjectured to be bounded by the Arctic Ocean, a part of which Hearne was supposed to have seen, and, as is now well ascertained, actually had seen on his visit to the Coppermine River in 1771. Mackenzie, attended by a German, four Canadians, and three Indians, together with two Canadian and two Indian women, left Fort Chipewyan, 3rd June, 1789. Embarking in their four canoes on the Slave River, the party reached the Slave Lake, with which it communicates by a course of 170 miles, on the 9th of the same month. Resting there six days, during which the ice somewhat gave way, they launched their canoes again on the 15th, and skirting the margin of the lake, reached the entrance of the river which flows from its western extremity, and is now called the Mackenzie river, on the 29th. Mackenzie pursued the north-westward course of this river, with a perseverance and intrepidity which no dangers or difficulties could subdue, till on the 15th of July it brought him to the object of his hopes, the great Northern Ocean, in lat. 69°. Returning by the same route, the party regained Fort Chipewyan on the 12th of September. On the 10th of October, 1792, Mackenzie set out from the same point on another adventurous journey, the object of which was to reach the Pacific; an attempt, the first made in North America, in which he was also successful. Proceeding partly by the Ungigah or Peace river, and partly by land, after encountering still greater difficulties than on his former expedition, he reached the sea on the 23rd of July, 1793, and returned in safety by nearly the same route. Of both his journeys Mackenzie has himself given a full account in his 'Voyages from Montreal, on the river St. Lawrence, through the Continent of North America, to the Frozen and Pacific Oceans, in the years 1789 and 1793,' 4to. Lond., 1801. The account is preceded by a general history of the fur trade (130 pages), and the volume is embellished with a portrait of the author, who soon after received the honour of knighthood. We have not been able to ascertain the date of Sir Alexander Mackenzie's death, but his name is inserted in 'A Biographical Dictionary of the Living Authors of Great Britain and Ireland,' 8vo., Lond. 1816.

MACKENZIE RIVER. [Hudson's Bay.]

MACKEREL. [Scomber.]

MACKEREL FISHERY. [Fisheries.]

MACKINTOSH, SIR JAMES, was born at Aldourie, on the banks of Loch Ness, within seven miles of Inverness, on the 24th of October, 1765. He was the son of Captain John Mackintosh, the representative of a family which for above two centuries had possessed a small estate called Kellachie, which Sir James inherited from him. Sir James Mackintosh received his education at the universities of Aberdeen and Edinburgh, at the latter of which places he took the degree of M.D., intending to practise medicine, with which view he repaired to London. He afterwards however changed his destination, and was called to the bar in 1795, by the Society of Lincoln's Inn. In 1804 he went to India as recorder of Bombay. He returned to England in 1812; in 1818 he was appointed to the professorship of law and general politics in the college instituted for the education of the civil servants of the East India Company at Haileybury. In 1830, when the Whigs came into office, Sir James was appointed a commissioner for the affairs of India. He died on the 30th of May, 1832.

Sir James's principal works are his 'Vindiciæ Gallicæ,' his 'History of England' (which he left unfinished at his death), and his 'Dissertation' prefixed to the 'Encyclopædia Britannica,' a new edition of which has lately appeared, with notes, &c., by Professor Whewell.

The 'Vindiciæ Gallicæ' is written in an easy flowing style, and displays a considerable surface of reading, the effect of which was the greater from its lying out of the track of English study at that time. This gave him some advantage over his opponent Burke, whose ignorance of the writings of the French *Economistes* was happily exposed. The 'Vindiciæ Gallicæ' obtained for its author great and sudden reputation.

The 'History of England' (published in Dr. Lardner's 'Cyclopædia,' in which work the 'Life of Sir Thomas More' is also from his pen) he left unfinished by his somewhat premature and unexpected death; and this may in part account for its being unequally executed. Particular passages of the story are rather carefully investigated; the survey of others is very slight and unsatisfactory. The remarks on some constitutional points are interesting. The general spirit is that of a very courteous and tolerant whiggism. Besides the history above mentioned, Sir James published a History of the Revolution in England in 1688, a fragment 'completed by the editor.'

In respect to his 'Dissertation' prefixed to the 'Encyclopædia Britannica,' and purporting to be 'A General View of the Progress of Ethical Philosophy, chiefly during the Seventeenth and Eighteenth Centuries,' it will be necessary to say a few words.

To write a good outline of the progress of ethical philosophy, from Socrates to Brown, tracing the course of error to its exposure, and of truth to its establishment, would require extensive reading, patient thinking, and rigid impartiality, and remains to be done; to compose a smooth, readable, drawing-room essay, is easier, and Sir James Mackintosh has done it. The retrospect of antient ethics (s. 2) is fairly written, and may have been the result of a careful perusal of Enfield, with occasional references to Cudworth. The retrospect of scholastic ethics (s. 4) bears a like relation to Bayle. The sections on 'Modern Ethics,' the 'Controversies on the Moral Faculties' (5), and the 'Foundations of a more just Theory of Ethics,' contain a review of the principal authors, and some ingenious efforts to establish Dugald Stewart's opinions on the moral sense. There is little to show that Sir James had studied any of the authors whom he criticises, except Stewart; and from the hasty and rather flippant way in which he speaks of some, particularly Mandeville and Mill, it would be less injurious to his memory to suppose that he adopted the opinions of others, than that he expressed his own after actual reading.

The language of the 'Dissertation' is fluent, but not clear and precise, and thought seems to be often sacrificed to expression, or perhaps expression studied as a substitute for thought. As a guide to the student of morals and metaphysics, it is of little value; on the contrary, from the want of clearness and precision in the language, and the habit of mistaking words for thoughts, and paying in the former coin instead of the latter, we should consider it as rather a pernicious book to place in the hands of the young. There is little danger of the more mature (at least of those whose taste has been formed on a severe and masculine standard) reading or being influenced by such works as this.

Besides the above-mentioned works, Sir James Mackintosh contributed largely to the 'Edinburgh Review.'

(*Memoir of the Life of the Right Honourable Sir James Mackintosh*, edited by his son Robert James Mackintosh, Esq., Fellow of New Coll., Oxf., 2 vols. 8vo.,London, 1835.)

MACKLIN, CHARLES, an actor and dramatic writer. His family name was Maclaughlin. The exact place and date of his birth are unknown; but according to the account of a female relative, 'he was two months old at the battle of the Boyne' (July 1, 1690), a few days previous to which event his mother travelled with him from Drogheda to a little village six miles off, in which they resided for some years. At the age of fourteen he was apprenticed to a saddler, but soon ran away and came over to England, where he contracted a marriage with the widow of a publican in the Borough. The circumstance coming to the ears of some friends, the marriage was dissolved on the grounds of *nonage*, and he was sent back to Ireland, when he became a badgeman in Trinity College, Dublin. At the age of twenty-one he again visited England, joined a strolling company, and played Harlequin, returned to Trinity College, and again to England in 1716, when he recommenced actor at Bristol. In 1725 he was a member of Mr. Rich's company at the Lincoln's Inn Fields theatre, London. On the 10th May, 1735, he unfortunately killed a brother performer, named Hallam, by accident in a quarrel, for which he was tried and found guilty of manslaughter. On the 14th February, 1741, Macklin established his fame as an actor in the character of Shylock. In 1753 he took leave of the stage, and on the 11th March, 1754, opened a tavern and public ordinary in the Piazza, Covent Garden, adding to it 'a school of oratory and criticism,' in which he gave lectures, full dressed, only to be laughed at by Foote and other wags of the day. This scheme failing, Macklin became a bankrupt, and in 1757 went to Dublin, where he assisted in laying the first stone of the Crow-Street theatre. In 1759 he accepted an engagement at Drury-Lane, and from thence went to Covent-Garden. On the 18th November, 1773, he was driven from the stage by a cabal, but brought an action, and obtained damages against the ringleaders. On the 28th November, 1788, while representing the character of Sir Pertinax MacSycophant, in his own comedy, 'The Man of the World,' his memory suddenly and entirely failed him. He made a last attempt for his own benefit, May 7, 1789, in the character of Shylock, but was unable to complete the part.

Macklin died July 11, 1797, at the great age (it is supposed) of 107, and was buried in the chancel of St. Paul's, Covent Garden.

There are ten dramatic pieces ascribed to him, but two only have kept possession of the stage, 'Love à la Mode,' a farce, and 'The Man of the World,' a comedy. His memoirs, written by J. T. Kirkman, Esq., were published in two vols. 8vo., London, 1799.

MACKNIGHT, JAMES, D.D., born 1721, died 1800, a divine of the Church of Scotland, of distinguished eminence among the theological writers of the last century. He was born in Argyleshire, studied in the university of Glasgow, but, like many of the Presbyterian divines both of his own country and of England, went abroad and finished his studies at Leyden. On his return he became a minister in the Scotch Church, and was appointed, in 1753, pastor of Maybole. In this situation he spent sixteen years, during which time he prepared two works; one, 'A Harmony of the Gospels,' with copious illustrations, being in fact a life of our Saviour, embracing everything which the evangelists have related concerning him; the other, 'A new Translation of the Epistles.' Both these works were favourably received, and are by many persons highly esteemed. The 'Harmony' has been repeatedly printed, and to the later editions there are added certain dissertations on curious points in the history or antiquities of the Jews. The theology of them is what is called moderately orthodox. While at Maybole he published also another theological work, which is held in great esteem, in defence of 'The Truth of the Gospel History.' For these his valuable services to sacred literature, Dr. Macknight received such rewards as a Presbyterian church has it in its power to give. The degree of D.D. was conferred upon him by the university of Edinburgh. In 1769 he was removed from Maybole to the more desirable parish of Jedburgh, and in 1772 he became one of the ministers of the city of Edinburgh. Here he continued for the remainder of his life, useful in the ministry, though not accounted one of the most attractive and engaging of the preachers in that city. His attention to his theological studies was unabated, and in 1795, at the age of 74, he produced his 'Literal Translation of all the Apostolic Epistles,' with a large apparatus of Commentary and Notes, and a Life of the Apostle Paul.

There is an account of the life of Dr. Macknight by his son.

MACLAURIN, COLIN, one of the most eminent of Scottish mathematicians, was descended of an antient family in Argyleshire, and was born at Kilmoddan, in that county, in February, 1698. His father was a minister of the kirk, and died shortly after the birth of his third son Colin: his mother also died when he was very young, and the care of his education devolved upon an uncle, who sent him to the university of Glasgow at the age of eleven. It is said that in the following year, meeting accidentally with a copy of Euclid, he made himself master of the first six books in a few days, a story utterly incredible upon the mere statement. It is said also, and with much more likelihood, that at the age of sixteen he had invented many of the propositions afterwards published in his 'Geometria Organica.' However this may be, he took the degree of Master of Arts with distinction in the fifteenth year of his age (1713), and afterwards lived in studious retirement till the autumn of 1717, when, after a severe competition and ten days' examination, he obtained the professorship of mathematics at the Marischal college, Aberdeen. In 1719 and in 1721 he visited London, and formed the acquaintance of many eminent men, particularly of Newton. In 1722 he travelled on the Continent as tutor to a son of Lord Polwarth; but the death of his pupil during their tour occasioned his return to Aberdeen.

In 1725 he was appointed to assist James Gregory, whose strength was declining, in the duties of his chair at Edinburgh. The want of funds to pay an assistant placed difficulties in the way of this arrangement, which were removed, but how is not clearly stated. We mention them here to record, in honour of Maclaurin, that Newton, on hearing of the obstacles, offered to pay twenty pounds a year, till Gregory's death, towards the assistant's salary, if Maclaurin were to be appointed. At Edinburgh he remained almost all the remainder of his life. When the Rebellion broke out in 1745, he exerted himself vigorously for the existing government, and the hasty works which were thrown up for the defence of Edinburgh were planned and superintended by him: fatigue and exposure laid the foundation of a mortal disorder. When the pretender entered Edinburgh, Maclaurin withdrew, to avoid making the submission which was demanded of all who had volunteered to defend the town: but he had previously managed to introduce a good telescope into the castle, and to contrive a method of supplying the garrison with provisions. He accepted the invitation of Dr. Herring, archbishop of York, with whom he remained till it was safe to return to Edinburgh. Shortly after his return he died of dropsy, June 14, 1746, aged 48 years and four months. The preceding particulars come originally from a eulogy spoken before the university by his friend and colleague Dr. Monro, the substance of which was affixed, in a biographical form, to the posthumous work on Newton's discoveries, by the editor, Patrick Murdoch. This has been copied into the 'Biographia Britannica,' Martin's 'Biographia Philosophica,' &c.: being the only authentic account of which we know.

Maclaurin married in 1733, and his wife, with two sons and three daughters, survived him. Of his character it can only be stated, from the general eulogy, that it was such as secured him the highest regard of his contemporaries.

The writings of Maclaurin are not numerous, but they have exercised considerable influence upon the mathematical studies of this country; more however we think, in what has been taken from them, or on their model, by others, than in the extensiveness of their own circulation. There is both originality and depth in all of them, and we shall proceed to notice them separately.

1. The various papers which he published in the 'Philosophical Transactions' are on subjects intimately connected with his separate works. The numbers of the 'Transactions' in which they occur are 356, 359, 364, 377, 394, 408, 439, 461, 467, 469, 471.

2. 'Geometria Organica, sive descriptio linearum curva-

rum universalis,' Londini, 1720. This is an elaborate treatise on the description of curves by the intersections of moving straight lines.

3. In 1724 he gained the prize of the Academy of Sciences for an essay, proposed by that body, on the Leibnitzian method of measuring the force of bodies in motion. In 1740 he divided with Daniel Bernoulli, Euler, and Cavallieri, the prize of the same academy for an essay on the tides. This work is printed in what is called the Jesuits' edition of Newton.

4. 'A Treatise of Fluxions,' Edinburgh, 1742 (2 vols. 4to.; a second edition about 1801, 8vo.). The immediate cause of this work was the attack of Berkeley upon the first principles of Fluxions, in his 'Analyst:' it is of great prolixity, as might be expected in an elementary treatise which is written entirely on the defensive; but it must always be remarkable as having been the first work in which the principles of fluxions were placed in logical connexion with each other. The details are very extensive, forming a great body of applications, several of them quite new at the time. Among others is the theorem now known by the name of Maclaurin, but which had been previously noticed by Stirling. [TAYLOR'S THEOREM.] Of all the treatises which have been organised upon the fluxional principle, this is undoubtedly the most sound as well as complete.

5. 'A Treatise on Algebra,' 1748 (sixth edition, 1796). This work certainly surpassed all its predecessors in clearness, though far from being as logical a work as the 'Fluxions.' It contains two appendices on the general properties of curves. It was left not quite complete, and was finished by an editor.

6. 'An Account of Sir Isaac Newton's Philosophical Discoveries,' London, 1748. This work also was published from the author's papers; the editor was Patrick Murdoch. After the death of Newton, his nephew Mr. Conduitt proposed to publish his Life, and applied to Maclaurin for assistance. The latter immediately prepared an account of the philosophical systems which preceded that of Newton. But Mr. Conduitt's death frustrated the plan, and Maclaurin, extending his design to the length of explaining all Newton's mechanical and cosmical discoveries, left this work in the state in which it was printed. The optical discoveries were omitted, and the editor states that the author's intention seems to have been the explanation of those parts only of Newton's discoveries which had been and were controverted. In the present day, when popular explanation of scientific points has been well studied, it would be easy to name works which are preferable to that of Maclaurin in matter and form; but in style it would be difficult to do the same. At a time when the theory of gravitation was hardly admitted by many at home, not yet received by any of note abroad, and really understood by very few, such a work was of peculiar value.

Besides the preceding, Maclaurin edited in 1745 an edition of David Gregory's 'Practical Geometry.' He was also actively engaged in many matters closely connected with scientific publication. We need do no more than mention his exertions to found an observatory at Edinburgh, which did not succeed, and a medical society: to the latter he contributed several papers. He was engaged at one time in promoting the survey of part of the north of Scotland; at another in examining and reporting on the manner of gauging vessels; and he organized and computed tables for a provident society for the widows and orphans of the Scottish clergy, in a manner which secured the stability and usefulness of the scheme.

MACLAURIN'S THEOREM. [TAYLOR'S THEOREM.]

MACLE (*Chiastolite*) occurs crystallized. Primary form a right rhombic prism. Cleavage parallel to the lateral faces of the primary form. The crystals appear to be composed of two substances: one of a yellowish white, sometimes translucent and of a glassy fracture; the other bluish black, opaque and dull. Fracture scaly, slightly concoidal. Hardness 5·0 to 5·5. Streak white. Lustre vitreous, or vitreo-resinous. Specific gravity 2·944.

The white portion is infusible by the blow-pipe, but becomes whiter; with borax it fuses difficultly into a transparent glass. The black portion fuses into a black glass. Nitric acid dissolves it entirely.

It occurs imbedded in clay-slate on Skiddaw in Cumberland, in Wicklow, in the Pyrenees, and in many other places.

It yields, by the analysis of Landgrabe,

Silica	68·49
Alumina . . .	30·17
Magnesia . . .	4·12
Oxide of Iron . .	2·70
Water	·27
	105·75

MACLUREITE (*Condrodite, Brucite*) occurs imbedded in rounded masses, the larger of which present occasional crystalline appearances of rhombic prisms with dehedral terminations. Cleavage parallel to the lateral planes. Fracture uneven. Hardness 6·5. Specific gravity 3·15 to 3·25. Colour yellowish or brown. Lustre vitreous. Becomes negatively electrical by friction. Transparent, translucent.

Infusible by the blow-pipe, but becomes colourless. With borax fuses into a transparent glass, coloured by oxide of iron. Not affected by acids.

It occurs in New York and New Jersey, and also at Pargas.

Analyses—No. 1, by D'Ohssor, from Pargas; No. 2, from New Jersey, by Seybert:—

	No. 1.	No. 2.
Silica . .	38·00	32·66
Magnesia . .	54·00	54·00
Oxide of Iron .	5·10	2·33
Alumina . .	1·50	0·00
Potash . .	0·86	2·11
Fluoric Acid .	0·00	4·09
	99·46	95·19

MACO'MA, Leach's name for the Venus tenuis of De Blainville, and similar species. [VENERIDÆ.]

MÂCON, a town in France, capital of the department of Saône et Loire, situated on the right or west bank of the Saône, in 46° 18′ N. lat. and 4° 50′ E. long.; 205 miles from Paris in a direct line south-east, or 244 miles by the road to Lyon through Sens, Auxerre, Autun, and Châlons sur Saône.

Mâcon was one of the towns of the Ædui, and is mentioned by Cæsar (*De Bell. Gall.*, lib. vii., c. 90) under the name of Matisco, from the oblique cases of which the present name, which was formerly written Mascon, is derived. It is mentioned in the 'Itinerary' of Antoninus, and in the 'Notitia Imperii,' in which latter it is designated Castrum, a fortress, and is noticed for the manufacture of arrows. It suffered much from the barbarians who overran the Roman empire, especially from Attila. It passed into the hands of the Burgundians and the Franks; was included in the kingdom of Bourgogne under Boson, and in the duchy of Bourgogne under the later dukes. It was much injured in the religious wars of the sixteenth century. Before the Revolution it was a bishop's see.

The town is on the declivity of a hill sloping down to the Saône, along the bank of which is a noble quay, from which the distant Alps may be seen. A green island occupies the centre of the stream opposite to the quay: and an antient, perhaps Roman bridge, of thirteen arches, more remarkable for solidity than beauty, connects the town with the village of St. Laurent on the other side of the river, in the department of Ain, which is commonly regarded as a suburb of Mâcon. The streets of Mâcon are crooked, narrow, and ill paved: the houses are usually of stone, and substantially built. Considerable improvements have been made of late years. The ramparts of the town have been demolished and their site laid out in promenades. The former cathedral was ruined in the troubles of the Revolution, but the episcopal residence escaped, and is used for the prefect's office. The chief public buildings are the town-hall, the antient palace of Montrevel, the theatre, and the baths, all on the quay; the general hospital, on the parade; the new church of St. Vincent, and the new prison. Among the Roman antiquities are a triumphal arch and the ruins of a temple of Janus. The population in 1831 was 10,998; in 1836 it was 11,944. The inhabitants carry on a considerable trade in the wines of the district, some of which are excellent. There are some manufactures of hosiery, linens, linsey-woolsey, earthenware, clocks and watches, and especially confectionary. There are several tan-yards and cooperages. There is a well frequented weekly market in the town, and a large corn-market is held in the village of St. Laurent. There are several yearly fairs.

Mâcon has a high school, a school of mutual instruction, and a drawing-school. There is a society of agriculture, science, and art, which possesses a good library. There are three hospitals or poor-houses, and a society for relieving the poor at their own homes. There are a primary court of justice, a tribunal de commerce, and several government offices.

The arrondissement of Mâcon has an area of 474 square miles, and comprehends 133 communes, and 9 cantons, or districts, each under a justice of the peace. The population in 1831 was 114,061; in 1836 it was 115,777. The environs of the town are delightful and productive.

Mâcon had in the middle ages counts of its own. Their county constituted the district of the Mâconnois, which nearly coincided with the present arrondissement. This district had its own states or assembly for assessing the taxes. Louis IX., otherwise Saint Louis, purchased the county of Mâcon and united it to the domains of the crown. It formed part of the duchy of Bourgogne, either at its reformation in the reign of Jéan II., or by subsequent cession of Charles VII. to the duke Philippe le Bon. [Bourgogne.] Louis XI. reunited it to the crown of France.

MACPHERSON, JAMES, was born in 1738, at the village of Ruthven in Inverness-shire, and was sent in 1752 to King's College, Aberdeen, with a view to be educated for the Scotch church. On leaving college he was appointed schoolmaster of his native village; and it was while holding this situation that he gave to the world what appears to have been his first publication, a poem entitled 'The Highlander,' in 1758. Before this date however he had written some other poetical pieces, among which are mentioned one called 'Death,' and another called the 'Hunter,' which last is said to have been only a rude sketch of the 'Highlander.' Soon after he sent to the 'Scots Magazine' several contributions in verse, which have been preserved from oblivion by the great controversy that afterwards arose about his capacity for manufacturing the poems ascribed to Ossian, which he professed to have only translated. Some attention appears to have been first given to the traditional poetry preserved in their native dialect among the Scotch Highlanders, by Dr. Adam Ferguson, the well known historian, himself a mountaineer; by him an interest in the subject was communicated to his friends the Rev. Dr. Carlyle, minister of Inveresk, a gentleman of extensive connexions among the literary men of his day, and John Home, the author of 'Douglas.' The two latter met with Macpherson in the autumn of 1759, when he showed them some fragments of Gaelic verse, of which they prevailed upon him to furnish them with translations. These were shown to Dr. Blair, and the poets Shenstone and Gray, by all of whom they were greatly admired; and in 1760 they were published under the title of 'Fragments of Antient Poetry, collected in the Highlands of Scotland, and translated from the Gaelic or Erse Language,' with an anonymous preface by Blair. A reprint of this publication is given in the 2nd volume of Dodsley's 'Fugitive Pieces,' Lond., 1761, pp. 117-163. The fragments are sixteen in number. The effect was to induce the faculty of advocates in Edinburgh to raise a subscription for enabling Macpherson to make a tour through the Highlands with the object of collecting more poetical treasure of the same kind. What he found, or pretended to have found, he brought to London, and published there in two successive volumes, the first of which appeared in 1762, under the patronage of Lord Bute, with the title of 'Fingal, an Epic Poem in six books, with other lesser Poems;' the second in 1763, with the title of 'Temora, an Epic Poem in eight books, with other Poems.' From the first, the genuineness of these Gaelic epics was questioned by many persons; but it was more zealously asserted by more, and to Macpherson himself the notoriety which he acquired was the beginning of a long course of good fortune. In 1764 he obtained the situation of private secretary to Captain Johnstone, on the appointment of the latter as governor of Pensacola; and he was also made surveyor-general of the Floridas, in which capacity he went out to America and the West Indies, and returned to England in 1766, retaining his salary of 200*l.* a year for life. Some of the years that followed he spent chiefly in literary labour, much of it, from the popularity of his name, highly profitable. In 1771 he published, in one vol. 4to., a disquisition on the antiquities of the Scottish Celtic race, under the title of 'An Introduction to the History of Great Britain and Ireland;' in 1773 a prose translation of the 'Iliad' of Homer; in 1775 a 'History of Great Britain from the Restoration to the accession of the House of Hanover,' in 2 vols. 4to., together with 2 vols. of 'Original Papers,' which last work he sold to the booksellers for 3,000*l.* During this period of his life he also wrote several pamphlets for the ministry, in support of the war against the American Colonies, which are now all nearly forgotten. At last his appointment to the lucrative office of agent to the nabob of Arcot turned his versatile mind and pen to Indian affairs, upon which he also produced a succession of publications of temporary interest. This post brought him into parliament in 1780, as member for Camelford, for which he sat till 1790. He then retired to a considerable property which he had purchased in his native county of Inverness, where he died 17th February, 1796. His body was brought back to England for interment in Westminster Abbey. (*Edinburgh Encyclopædia*, the editor of which, Dr. (now Sir David) Brewster, married a daughter of Mr. Macpherson.) [Ossian.]

MACQUARIE, river. [Australia.]

MACRA'SPIS (*MacLeay*), a genus of Coleopterous insects of the section *Lamellicornes*, and, according to Latreille's classification, belonging to the third division of that group, the *Xylophili*. The genera *Macraspis* and *Chasmodia* constitute two closely allied groups of the family *Rutelidæ*, the species of which inhabit the warmer parts of South America, and are remarkable for the large size of their scutellum. They are of tolerably large size (averaging about three-quarters of an inch in length, or rather more), usually very smooth and glossy, and often exhibit brilliant colours, green, brown, and yellow being the most common hues observable in the various species. There are some however which are of a glossy-black colour, and others which have yellow markings on a black ground (*Macraspis quadrivittata*, Olivier). The body is of an ovate form (the head and thorax having an outline continuous with that of the abdomen, or nearly so), convex above and beneath. The sternum is produced anteriorly into a pointed process, which projects between the anterior pair of legs.

In the genus *Macraspis* the mentum is longer than broad, slightly contracted anteriorly, and without any fringe of hairs on the anterior margin; the mandibles are almost triangular, and have the apex pointed and notched; the maxillæ have several denticulations.

The genus *Chasmodia* (MacLeay) is chiefly distinguished from Macraspis by the obtusely terminated mandibles, which have no notch at the extremity; the maxillæ having a tuft of hairs and only two denticulations, and the mentum being of a somewhat ovate form, distinctly contracted towards the apex and furnished with hairs. The claws of the tarsi are simple, whereas in Macraspis one of the claws of each tarsus, at least of the four anterior legs, is bifid.

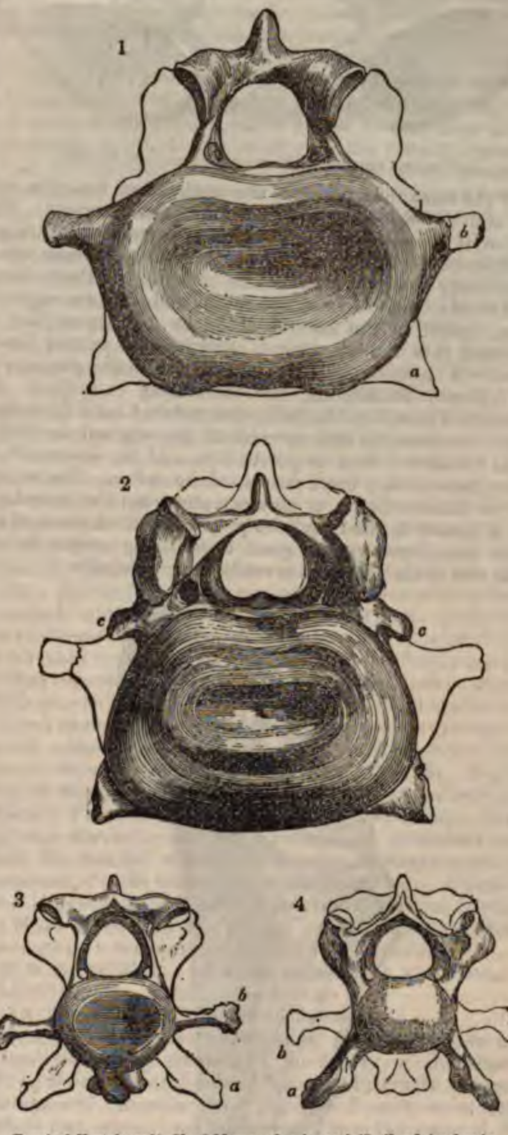
The insects of these two genera fly by day about trees, emitting a humming noise, and feed upon flowers. Collections formed in Brazil usually contain many of these insects.

Dejean, in his 'Catalogue des Coléoptères,' enumerates twenty-six species of *Macraspis* and five of *Chasmodia*.

MACRAUCHE'NIA, Professor Owen's name for a large extinct Mammiferous animal, referrible to the order *Pachydermata;* but with affinities to the *Ruminantia* and especially to the *Camelidæ*.

The remains on which the professor founded this genus included two cervical vertebræ, seven lumbar vertebræ, all more or less fractured; a portion of the sacrum and ossa innominata; fragments of the left scapula; of the right radius and ulna, and right fore-foot; the right femur nearly entire, the proximal and distal extremities of the right tibia and fibula; and a metatarsal bone of the right hind-foot. These portions of the skeleton were discovered by Mr. Darwin in an irregular bed of sandy soil, overlying a horizontal accumulation of gravel on the south side of Port St. Julian, on the east coast of Patagonia, and belonged to the same individual.

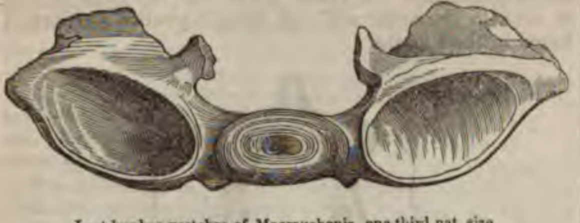
Mr. Owen observes that what is described as a perforation of a single transverse process in a cervical vertebra is essentially a space intervening between two transverse processes, a rudimental rib, and the body of the vertebræ, and the professor alludes to the manifestation of this structure in the cold-blooded saurians and in the *Ornithorhynchus*. He observes that the *Camelidæ* differ not only from the other ruminants, but from all other existing *Mammalia*, in the absence of perforations for the vertebral arteries in the transverse processes of the cervical vertebræ, the atlas excepted; and though it is true that in other *Mammalia* the two transverse processes are manifested on each side with their extremities united by a distinct cartilage, this appears in the fœtal state only, for the cartilage afterwards becomes ossified and anchylosed to them. After referring to the structures of the inferior transverse process or its representatives in the *Hippopotamus*, the *Marsupials*, and the *Giraffe*, Mr. Owen proceeds thus: 'In the long cervical vertebræ of the *Camel* and *Llama*, the upper and lower transverse processes are not developed in the same perpendicular plane on the side of the vertebræ, but at some distance from each other; the lower transverse processes (*fig.* 1, *a*) being given off from the lower part of the anterior extremity of the body of the vertebra; the upper ones (*fig.* 1, *b*) from the base of the superior arch near the posterior parts of the body of the vertebræ. The extremities of these transverse processes do not become united together, but they either pass into each other at their base, or continue throughout life separated by an oblique groove. This groove would not however afford sufficient defence for the important arteries supplying those parts of the brain which are most essential to life; and accordingly the vertebral arteries here deviate from their usual course, in order that adequate protection may be afforded to them in their course along the neck. From the sixth to the second cervical vertebra inclusive in the *Auchenia*, and from the fifth to the second inclusive in the *Cameli*, the vertebral arteries enter the vertebral canal itself, along with the spinal chord, at the posterior aperture in each vertebra, run forwards on the outside of the dura mater of the chord, between it and the vertebral arch, and when they have thus traversed about two-thirds of the spinal canal, they perforate respectively the superior vertebral laminæ, and emerge directly beneath the anterior oblique or articulating processes, whence they are continued along with the spinal chord into the vertebral canal of the succeeding vertebra, and perforate the sides of the anterior parts of the superior arch in like manner; and so on through all the cervical vertebræ until they reach the atlas, in which their disposition, and consequently the structure of the arterial canals, resemble those in other Ruminants. The two cervical vertebræ of the *Macrauchenia* present precisely the structure and disposition of the bony canals for the vertebral arteries which are peculiarly characteristic of the *Camelidæ* among existing *Mammalia*.' *Fig.* 2 shows the groove and orifices of the canal for the vertebral artery in a section exposing the spinal canal. Mr. Owen then goes on to show that the vertebræ of the Macrauchenia also closely resemble the middle cervical vertebræ of the Vicuña and Llama in their elongated form; approaching the Auchenial division of the *Camelidæ*, and deviating from the true camels in the relations of the length of the body of the vertebra to its breadth and depth, and in the much smaller size of the inferior processes. The author observes that, excepting the Giraffe, there is no existing Mammal which possesses cervical vertebræ so long as the Macrauchene; but that the cervical vertebræ of the Giraffe differ in the situation of the perforations for the vertebral arteries, and in the form of the terminal articular surfaces. Both the cervical vertebræ described by Mr. Owen are of the same size, and each measures 6½ inches in extreme length, 2 inches 10 lines in breadth, and 2 inches 4 lines in depth. Among the peculiarities of structure, a small longitudinal process (*fig.* 2, *c*) is given off immediately below the base of the anterior process, and this is not observable in any of the cervical vertebræ of the Giraffe or *Camelidæ*. In the form of the articulating surfaces of the bodies of the vertebræ, the Macrauchene deviates from the Giraffe and Camel, but resembles the *Auchenia*. The anterior articulating surface is convex and almost hemispheric in the Giraffe and Camel, whilst the posterior surface is proportionally concave, so that the vertebræ of the neck are articulated by ball and socket joints, yet not, as in most reptiles, with intervening synovial cavities, but by means of the concentric ligamentous intervertebral substance characteristic of the Mammals. The degree of convexity and concavity in the articular surface of the bodies of these vertebræ in the Llama and Vicuña is much less than in the Camels, and the former consequently carry their necks more stiffly and in a straight line. The anterior articulating surface in Macrauchenia is less convex than it is in the Llama, and the posterior surface is less concave. From an analysis of the comparative structure of these vertebræ in the Camels, the Llamas, and the Macrauchene, Mr. Owen infers that the latter carried its neck in the same stiff and upright position as is manifested in the Llamas.



Cervical Vertebræ (1, 2) of Macrauchenia, and (3, 4) of Auchenia, half nat. size.

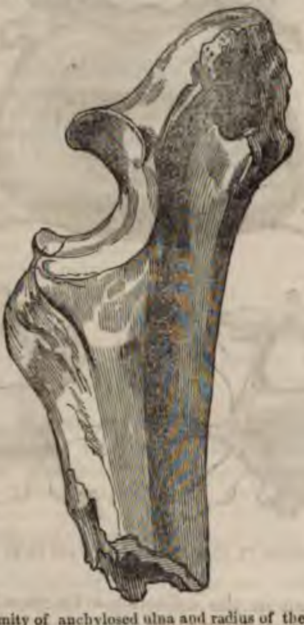
There is not in the collection a fragment of dorsal vertebræ, ribs, or sternum; but the seven lumbar vertebræ form a consecutive series from the same individual as that to which the cervical vertebræ belonged; and though these lumbar vertebræ do not possess such distinctive characters as those of the neck, they contribute not unimportantly to the illustration of the osteology of the animal and its affinities. No existing Pachyderm has more than six lumbar vertebræ; the Camels and Llamas only, among the Ruminants, possess seven; and here Mr. Owen discovered modifications of form in which the Macrauchene deviates from the *Camelidæ* and approaches the *Horse* and *Hippopotamus*. In the Macrauchenia, as in the Rhinoceros, Tapir, Hippopotamus, and Horse, the transverse processes of the last lumbar vertebræ are of considerable thickness and extent, and are joined by enarthrosis to the transverse processes of the sacrum; but the bony structure of these joints would indicate that they were not subject to be obliterated by anchylosis.

Sufficient of the sacrum and ossa innominata remain to enable Mr. Owen to state that the sacrum was anchylosed to the ilia: the lower boundary of this anchylosis is marked below by an external ridge, and by vascular canals and grooves in the substance of the bone, as in the Hippopotamus.



Last lumbar vertebra of Macrauchenia, one-third nat. size.

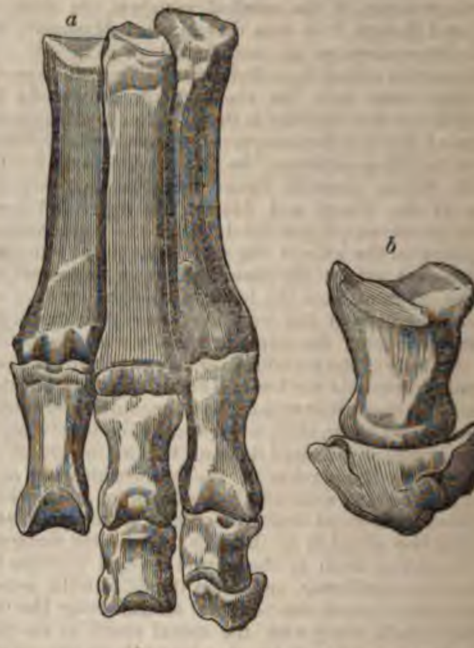
Of the remaining portions, the anchylosed fore-arm and leg, and the fore-foot, are the most characteristic. The portion of the antebrachium which is preserved presents a condition of the radius and ulna intermediate to those which respectively characterize the same bones in the Pachyderms and Camels. In the former, the radius and ulna are separate bones, united in the same position by a ligament, but so organized that the movement of supination cannot be effected. A bony confluence joins these bones partially in the ordinary Ruminants, but this rarely extends to the proximal extremities. In the Camel and the Llama the anchylosis is complete, so that no trace of the original separation of the radius and ulna is perceptible, and the olecranon, or elbow, appears as a mere process of the radius. The anchylosis in Macrauchenia is also complete, but the boundary-line is clearly defined, and the proportion which each of the bones contributes to the great articulating surface for the distal end of the humerus is easily distinguishable.



Proximal extremity of anchylosed ulna and radius of the Macrauchene, one-fourth nat. size.

Mr. Owen goes on to remark that the confirmation of the close affinity of the Macrauchenia to the Pachydermatous order, which the structure of the cervical vertebræ above might have rendered very doubtful, is afforded by the bones of the right fore-foot.

These are in so perfect a condition as to make it certain that the Macrauchene had three toes on the fore-feet, and not more; and that the fully developed metacarpal bones are distinct, and correspond in number with the toes, not being anchylosed into a single cannon-bone as in the Ruminants. The bones preserved are the metacarpals, proximal phalanges, and middle phalanges of each of the three toes, and the distal or ungueal phalanx of the innermost toe.



a, Bones of the right fore-foot of the Macrauchene, one fourth natural size, *b*, second and last, or ungueal phalanx, one-half natural size.

The author observes in continuation that the bones of the leg of the Macrauchene exhibit the same transitional structure as is afforded by the definable limits of the anchylosed bones of the fore-arm. In the Pachyderms the fibula is entire and distinct. In the Ruminants (the small musk-deer excepted, and, in an inferior degree, the elk) the fibula appears only as a short continuous process sent down from the under part of the external condyle of the tibia. In the *Camelidæ* the only trace of the fibula *is a still more rudimental* state of this process, whilst in the Macrauchene the fibula is indeed entire, but it is confluent with the tibia through nearly its whole extent. The fibula and tibia are distinct bones in both the Palæothere and Anoplothere. It is to the former genus, and especially to *Palæotherium magnum*, that the Macrauchene presents the nearest approach in the general form of the tibia, the principal leg-bone; but in the Macrauchene the tibia is relatively shorter and thicker, and straighter, and less expanded at its extremities, especially the upper one, than in any of the Palæotheres.

Of the few bones of the part which are preserved the astragalus is fortunately one. Mr. Owen has compared this bone (which he justly says is the very one that an anatomist would have chosen, had his choice been limited to a single bone) with the astragalus of the Giraffe and other Ruminants, the Camel, the Anoplothere, the Hippopotamus, Rhinoceros, Tapir, and Palæothere; and he comes to the conclusion that it is with the Pachyderms having three toes to the hind-foot that the *Macrauchenia* agrees in the main distinguishing characters of this valuable bone. The results of a paper of minute detail, great research, and happy combination, are thus summed up by the professor.

'Thus we obtain evidence, from a few mutilated bones of the trunk and extremities of a single representative of its race, that there once existed in South America a Pachydermatous quadruped, not proboscidian, which equalled in stature the Rhinoceroses and Hippopotamuses of the Old World. But this, though an interesting and hitherto unsuspected fact, is far from being the sum of the information which is yielded by these fossils. We have seen that the single ungueal phalanx bespeaks a quadruped of the great series of *Ungulata*, and this indication is corroborated by the condition of the radius and ulna, which are fixed immoveably in the prone position. Now, in the ungulated series there are but two known genera—the Rhinoceros and Palæotherium—which, like the quadruped in question, have only three toes on the fore-foot. Again, in referring the Macrauchenia to the tridactyle family of Pachyderms, we find, towards the close of our analysis, and by a detailed comparison of individual bones, that the Macrauchenia has the closest affinity to the Palæotherium. But the Palæotherium, like the Rhinoceros and Tapir, has the ulna distinct from the radius, and the fibula from the tibia; so that even if the Parisian Pachyderm had actually presented the same peculiarities of the cervical vertebræ as the Patagonian one, it would have been hazardous, to say the least, while ignorant of the dentition of the latter, to refer it to the genus *Palæotherium*.

'Most interesting indeed will be the knowledge, whenever the means of obtaining it may arrive, of the structure of the skull and teeth in the Macrauchenia. Meanwhile we annot but recognise in the anchylosed and confluent state of the bones of the fore-arm and leg, a marked tendency in t towards the Ruminant order, and the singular modifications of the cervical vertebræ have enabled us to point out he precise family of that order with which the Macrauchenia is more immediately allied. In first demonstrating this relationship it was shown in how many particulars the Camelidæ, without losing the essential characters of Ruminantia, manifested a tendency to the Pachydermatous type; nd the evidence which the lost genera, *Macrauchenia* and *Anoplotherium*, bear to a reciprocal transition from the Pachyderms to the Ruminants through the *Camelidæ*, annot but be viewed with extreme interest by the zoologist ngaged in the study of the natural affinities of the animal kingdom.'

'The Macrauchenia is not less valuable to the geologist n reference to the geographical distribution of animal orms. It is well known how unlooked-for and unlikely was he announcement of the existence of an extinct quadruped ntombed in the Paris basin, whose closest affinities were to genus (*Tapirus*), at that time regarded as exclusively South American. Still greater surprise was excited when species of the genus *Didelphys* was discovered to have o-existed in Europe with the *Palæotherium*. Now, on the ther hand, we find in South America, besides the Tapir, which is closely allied to the Palæothere, and the Llama, to which the Anoplothere offers many traces of affinity, the emains of an extinct Pachyderm, nearly akin to the European genus *Palæotherium;* and, lastly, this Macrau-henia is itself in a remarkable degree a transitional form, nd manifests characters which connect it both with the Tapir and the Llama.' (*Zoology of the Voyage of H.M.S. Beagle*, 1839.)

MACRI'NUS, OPI'LIUS, a native of Mauritania, was ræfect of the prætorium under Antoninus Caracalla, whom e accompanied in his expedition against the Parthians, d caused to be murdered on the march. [CARACALLA.] Macrinus was immediately proclaimed emperor by the army, D. 217, and his son Diadumenianus, who was at Antioch, as proclaimed Cæsar; both elections were confirmed by e senate. Macrinus, after a battle with the Parthians ear Nisibis, concluded peace with them. On his return to ntioch, he reformed many abuses introduced by Caracalla. ut his excessive severity displeased the soldiers, and an surrection, excited by Mœsa, the aunt of Caracalla, broke ut against Macrinus, who, being defeated near Antioch, ed as far as Calchedon, where he was arrested and put to eath, A.D. 218, after a reign of about fourteen months. He as succeeded by Elagabalus. (Dion Cassius; Capitolinus.)

MACRO'BIUS, AMBRO'SIUS AURE'LIUS THEO-O'SIUS, probably lived about the middle of the fifth ntury of the Christian æra. We possess hardly any parculars of his life; he is generally supposed to be the pern who is mentioned in the *Cod. Theod.*, vi. 8, as 'chamberin of the royal bed-chamber' (*sacri cubiculi præfectus*), ıring the reigns of Honorius and Theodosius the younger, ıt this does not appear certain. It has also been disputed hether he was a Christian or a pagan; it has been supsed, from his occupying so high a rank at the court of a hristian emperor, that he must have belonged to the hristian religion; but this opinion seems quite at variance ith the whole scope and tenor of his writings. The place his birth is uncertain; but he informs us himself, in his eface to the 'Saturnalia,' that the Latin language was not a mother-tongue.

Three works of Macrobius have come down to us; a commentary on the 'Somnium Scipionis' in the sixth book of icero's 'Republic;' 'Dialogues' which were supposed to ave taken place during the Saturnalia at the house of ettius; and a 'Treatise on the Latin and Greek Verb,' hich however is imperfect.

The commentary on the 'Somnium Scipionis,' which is vided into two books, is addressed to his son Eustathius. is principally occupied with the opinions of the later Planists respecting the laws which govern the earth and the her parts of the universe. There is a Greek version of is commentary by Maximus Planudes, in the king's rary at Paris.

The 'Saturnalia' is however the most important and inresting of the works of Macrobius. Although written in ry bad Latin, and full of trifling absurdities, it contains uch valuable information on many subjects relating to anquity. It is divided into seven books; the first contains a discussion on the origin of the Saturnalia and the principal Roman festivals, and on the character and history of several of the Roman deities: the second is of a more discursive nature; it unfolds at great length the whole art and mystery of joking according to the Roman notions, and relates some of the best jests of Cicero, Augustus, and other celebrated Romans, which however would scarcely excite a smile in modern society; it also gives a long account, among other things, of the luxury of the Romans, and contains a particular description of their favourite dishes. The third, fourth, fifth, and sixth books are occupied with an examination of Virgil's poems, in which a list is given of the principal passages which he imitated or copied from the Greek or preceding Latin poets; and the seventh is principally occupied with a discussion respecting the different kinds of food, and their effect on the human system.

The best editions of Macrobius are by Gronovius, Leyden, 1670; Zeunius, Leip., 1774 (which is said however, in the literary notices prefixed to the Bipont edition, to be very inaccurately printed); and the Bipont, 2 vols., 1788.

MACRODA'CTYLES, Cuvier's name for a family of Wading Birds (*Echassiers*) [GRALLATORES], which have very long *feet*, formed for running over marshy or water plants, or even for swimming, especially in those numerous species which have the feet fringed or bordered. There is not however any membrane between the bases of their toes, not even between those of the external ones. The *bill*, which is more or less compressed on the sides, is lengthened or shortened according to the genera, without however arriving at the fineness or weakness of Cuvier's preceding family. [LONGIROSTRES.] The body of these birds is also singularly compressed, a conformation which is governed by the narrowness of the sternum: their wings are moderate or short, and their flight weak. The hind toe in all is rather long. Cuvier observes that this family has been divided into two tribes, according to the presence or absence of the spur on the wing; but he adds that this character is not without exceptions. The following genera are arranged by Cuvier under this family, which terminates his order *Echassiers:—Parra, Palamedea* (including *Charina*), *Megapodius, Rallus, Fulica* (including *Gallinula* and *Porphyrio*), *Chionis*, Forst. (*Vaginalis*, Lath.), *Glareola*, Gm., *Phœnicopterus*. Cuvier's sixth order, *Palmipedes*, immediately succeeds this family, which is somewhat heterogeneous, and composed of birds whose habits are not similar. *Phœnicopterus* cannot be said to be without any membrane 'between the bases of the toes, &c.,' for its anterior toes are united to the nails by a lunated membrance. [FLAMINGO.]

MACRODI'TES. [FORAMINIFERA, vol. x., p. 348.]

MA'CROPA. [MEGALOPA.]

MACROPHTHA'LMUS. [GONOPLAX.]

MACROPO'DIANS, a tribe of brachyurous decapod Crustaceans, being the first of the family of *Oxyrhynchi* (Milne Edwards), and nearly corresponding with the genus *Macropus* of Latreille, remarkable for the enormous length of their feet, which has obtained for them the name of *Sea-Spiders*.

Form of the *Carapace* various, but in general triangular, very often not extending upon the last thoracic ring. The anterior *feet* short, and nearly always very slender; those of the succeeding pairs always more or less filiform; the length of the second pair often nine or ten times the length of the post-frontal portion of the *carapace*, and always much exceeding the double of that portion; the succeeding feet in general very long also. The basilary joint of the *external antennæ* nearly always constitutes the major part of the lower wall of the orbit, and proceeds to solder itself to the front. In the greater portion of the tribe the third joint of the *external jaw-feet* is inclined to oval or triangular, longer than it is wide, and does not support the succeeding joint on its anterior and internal angle, as in the other *Oxyrhynchi*. (M. Edwards.)

Habits, Food, &c.—The localities of the Macropodians are considerable depths in the sea, where they lie hid among the sea-weeds; they are also found on oyster-banks. They walk slowly and unsteadily. The weakness of their claws must render them not formidable to other marine animals, and the probability is that they live principally on *Annelids, Planariæ*, and small mollusks. (M. Edwards.)

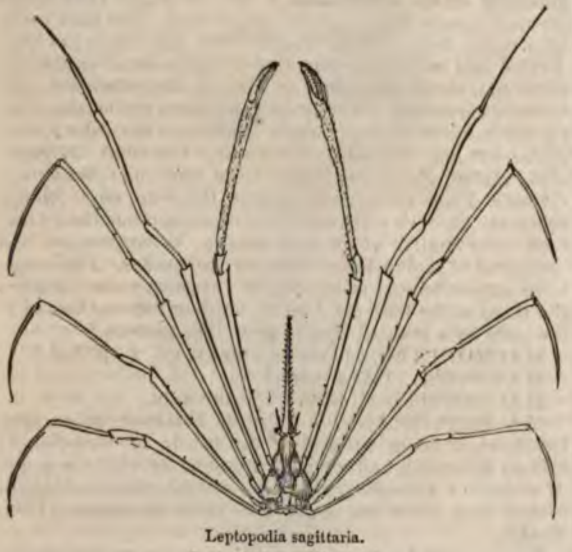
Genera. Leptopodia. (Leach.)

Established at the expense of the genera *Inachus* of Fabricius and *Macropus* of Latreille. M. Milne Edwards observes that it is very remarkable for the general form of its body and the excessive length of the feet; and states that it presents in an exaggerated manner all the distinctive characters of the family and of the tribe to which it belongs.

Generic Character.—Carapace nearly triangular, and not covering the last ring of the thorax; *rostrum* styliform and of enormous length; *eyes* large and not retractile; *internal antennæ*, when folded back, following the longitudinal direction of the body. First joint of the *external antennæ* very long and completely confounded with the neighbouring parts of the shell, the second inserted at a considerable distance in front of the orbits and below the rostrum. *Epistome* much longer than it is wide. Third joint of the *jaw-feet* nearly triangular, and carrying at its external angle the succeeding joint, which is very much developed. The *sternal plastron* as long as it is wide, but very much narrowed between the first pair of *feet*, which are very slender and extremely long, but less than any of the rest; the length of those of the second pair equals nine or ten times the length of the post-frontal portion of the carapace. *Abdomen* in both sexes composed of six joints, of which the first, which is very much developed, and as long as it is wide, occupies the dorsal surface of the body, while the last is formed by the soldering of the sixth and seventh abdominal rings. (M. Edwards.)

Geographical Distribution of the Genus. — Coasts of America and of the Antilles, as far as is at present known.

Example, *Leptopodia sagittaria*, Leach (*Cancer seticornis*, Herbst.; *Inachus sagittarius*, Fabricius).



Leptopodia sagittaria.

Latreillia. (Roux.)

Generic Character.—Carapace triangular, truncated anteriorly, and not covering the last ring of the thorax; *epistome* much longer than it is wide; second and third joints of the external *jaw-feet* very narrow; *feet* filiform and very long; *abdomen* of the female of five joints only, though the sutures of two others may be distinguished; structure of that of the male not known.

Example, *Latreillia elegans*, the only species known.

Description.—Carapace smooth, front armed above with two large divergent horns, and with a spine directed forwards between the antennæ; feet of the four last pair with the third joint spiny, the penultimate joint a little dilated above towards its extremity, and the tarsus very short; abdomen armed with six spines, two of which are situated on the median line, and four near the edges; length about an inch; colour yellowish.

Locality.—The coasts of Sicily.

M. Milne Edwards thinks that the *Maia seticornis* of Bosc should be placed near this species.

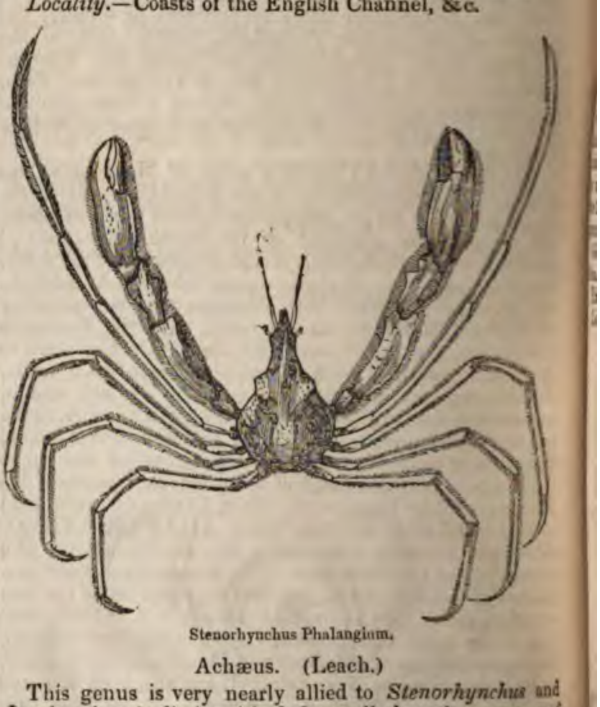
Stenorhynchus. (Lamarck; Latreille.)

Generic Character.—Carapace triangular and not prolonging itself above the last thoracic ring. *Rostrum* advanced, bifid, and sharp; *orbits* circular, eyes rather projecting and not retractile. Internal *antennæ* capable of being folded back longitudinally, and the fossets in which they are lodged not completely separated from each other. The first joint of the external antennæ confounded with the neighbouring parts and very narrow; the second inserted on the sides of the rostrum, and the third much longer than the second. *Epistome* longer than wide, and the *pterygostomian regions* rudimentary; *buccal frame* longer than it is wide: *external jaw-feet* narrow; third joint oval and the fourth rather long. *Sternal plastron* narrow between the anterior feet, but afterwards wider and presenting on the median line a suture which occupies the last segment of it. *Feet* of the first pair short, but much larger than the succeeding ones, the claw (manus) which terminates it convex, and the fingers a little curved inwards. Four last pair of feet filiform and extremely long; the length of those of the second pair equal five or six times of the width of the carapace; the others become progressively shorter; their penultimate joint is a little dilated towards the end, and the last joint is styliform and a little recurved. *Abdomen* in both sexes composed of six joints, the last of which is formed by the union (soudure) of the sixth and seventh rings. (M. Edwards.)

Geographical Distribution of the Genus.—European seas.

Example, *Stenorhynchus Phalangium* (*Cancer Phalangium*, Pennant; *Cancer rostratus*, Linn.; *Macropus Phalangium*, Latreille; *Macropodia Phalangium*, Leach).

Locality.—Coasts of the English Channel, &c.



Stenorhynchus Phalangium.

Achæus. (Leach.)

This genus is very nearly allied to *Stenorhynchus* and *Inachus*, but is distinguished from all the other genera of this family by the form of the posterior feet and some other characters.

Generic Character.—Carapace, as in the greater part of the family, not extending on the last segment of the thorax, nearly triangular, and convex on the branchial regions. *Rostrum* nearly null; eyes not retractile, and curved upon rather long peduncles; first joint of the external antennæ soldered to the front and advancing above the level of the internal canthus of the eyes; the second joint inserted on the sides of the rostrum and entirely exposed above. *Epistome* nearly square; third joint of the external jaw-feet longer than wide, nearly triangular, and giving attachment to the succeeding joint near its anterior and external angle. *Sternal plastron* suddenly narrowed between the anterior feet, which are slender and short, while those of the succeeding pairs are filiform; the second pair are nearly twice and a quarter longer than the post-frontal portion of the carapace, and terminate by a styliform and entirely straight joint; the succeeding feet are much shorter, and the terminal joint of the four last is large, compressed, and falciform. *Abdomen* composed of six joints in both sexes. (M. Edwards.)

Geographical Distribution of the Genus.—Achæus has, hitherto, been only found in the British Channel.

Example, *Achæus Cranchii.*

iption.—Rostrum formed of two small triangular d not extending beyond the second joint of the ex- ıtennæ; a spine on the anterior face of the ocular ıs; genital and cardial regions elevated in the form cles; feet with very long hairs, and hooked. from six to eight lines. Colour brown.

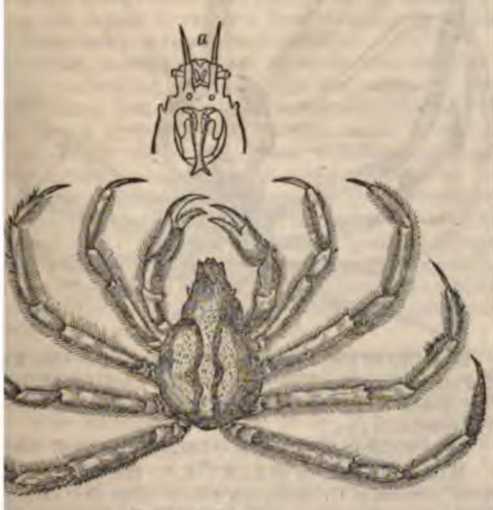
ity, Habits, &c.—Falmouth in England, and the f the Rance near Saint Malo. The species lives he sea-weeds and oysters.

Camposcia. (Leach; Latreille.)

ic Character.—Carapace convex and nearly pyri- t truncated anteriorly; *rostrum* rudimentary and reaching beyond the internal canthus of the orbits. ported upon peduncles, which are rather long, re- ınteriorly, and very large at their base; they are of being reflected backwards, but they are not , for there is no post-foraminary orbital cavity ng them, their extremity being only protected by f the lateral part of the carapace. The internal are reflected a little obliquely forwards; the fossets dge them have this particularity, viz. that they separated, as they are ordinarily, by a longitudinal and form only a quadrilateral cavity. The first he *external antennæ* is long and delicate, and is d nearly as far as the rostrum, carrying at its ex- moveable stem, which is consequently completely The *epistome* is nearly square, and the external are very much elongated and only close the mouth ly. The *feet* are slender and very long; in the ıe first pair are the shortest and are not stouter succeeding ones; those of the third, the fourth, fth pair are a little longer, and are also terminated ıdrical nail slightly curved downwards. Form of f the male, and disposition of the abdomen in this t known. (M. Edwards.)

phical Distribution of the Genus.—The seas of

le, *Camposcia retusa.*
y unknown.



Camposcia Retusa.
a, details of head.

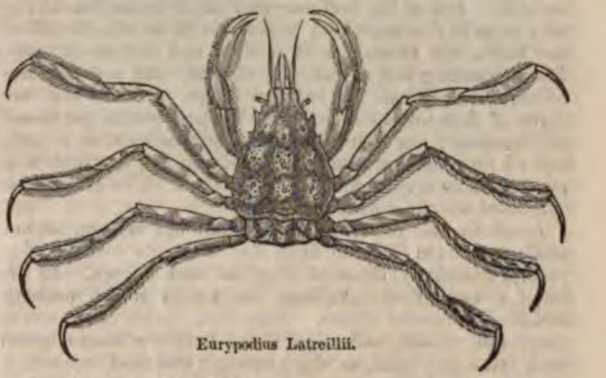
Eurypodius. (Guérin.)

s forming in certain points a passage between the *lians* already noticed and some of the *Maiidæ*, *Halimus auritus;* approaching the latter in the he feet, and resembling the former in the length ıembers and in the disposition of the eyes.

Character.—Carapace triangular, twice as long de, rounded posteriorly, narrow anteriorly, convex ual above; *rostrum* formed by two long and hori- rns; *eyes* carried on peduncles of moderate length etractile; disposition of the internal and external nearly the same as in *Stenorhynchus*, *Inachus*, &c.; wider than it is long; third joint of the external ıearly square, as wide as it is long, and deeply nterioriy and internally, in order to give insertion ceeding joint. Anterior *feet* of the length of the ıe male and much shorter in the female; they are a little convex and the fingers are slightly curved inwards. The succeeding feet are very long, their third joint is cylindrical, but the fifth is compressed and dilated below; its greatest width is below the middle; the finger is large, recurved, very sharp, and capable of being bent back against the lower edge of the preceding joint, after the manner of a subcheliform claw; the length of the second pair of feet is nearly twice and a half that of the post-frontal portion of the carapace, and the succeeding feet diminish successively in length but very little. *Abdomen* composed of seven joints in both sexes. (M. Edwards.)

Geographical Distribution.—Indian Sea.

Example, *Eurypodius Latreillii.*



Eurypodius Latreillii.

Locality.—Falkland Islands.

Amathia. (Roux.)

This genus agrees in some respects with the *Periceræ* of Latreille; indeed the aspect of both is the same, but the external antennæ of *Amathia* have not the peculiar disposition which is visible in *Pericera*, and the space which the orbits leave between them is scarcely wider than the base of the *rostrum*, whilst in Pericera it is more than double.

Generic Character.—Carapace in the form of an elongated triangle with a rounded base; its upper surface and its borders beset with enormous spines; the *rostrum*, which is terminated by two large divergent horns, nearly as long as the post-orbitary portion of the carapace. *Eyes* small and partially protected by a spine which occupies their external canthus, but, as in the preceding genera, they are not retractile and always remain projecting. *External antennæ* presenting nothing remarkable; the basilary joint is long, very narrow, and soldered to the front; the stem is inserted under the rostrum, at some distance before the level of the eyes; it is very slender, and its two first joints are of equal length. *Epistome* large and nearly as long as it is wide; the third joint of the external jaw-feet is dilated outwards and truncated at its two internal angles. The first pair of *feet* are shorter than the succeeding ones; they are filiform in the female and a little convex or swollen in the male. The succeeding feet are long and filiform; the second pair are more than thrice as long as the post-orbitary portion of the carapace, without including the posterior spine; the others are much shorter, their terminal joint is long, sharp, and without either spines or teeth on its inferior surface. *Abdomen* composed of seven joints in both sexes. (M. Edwards.)

Example, *Amathia Rissoana.*

Description.—Carapace armed with thirteen enormous spines, three of which elevate themselves from the stomachal region, one from the cardial, and the others occupy the border of the buckler; one on the intestinal region, three on each side upon the branchial region, and one upon each of the hepatic regions: there is a small spine in front of the eyes, and a larger one at the anterior angles of the buccal frame. Feet, as well as the carapace, covered with a sort of down. Length about two inches; colour yellowish, with two spots, red upon the front.

Locality.—Toulon.

Inachus. (Leach.)

The genus *Inachus*, as established by Fabricius, comprehended nearly all the *Oxyrhynchi*, with the exception of the *Parthenopidæ*. The genus is now much restricted.

Generic Character.—Carapace nearly triangular, not much longer than it is wide, and highly embossed above

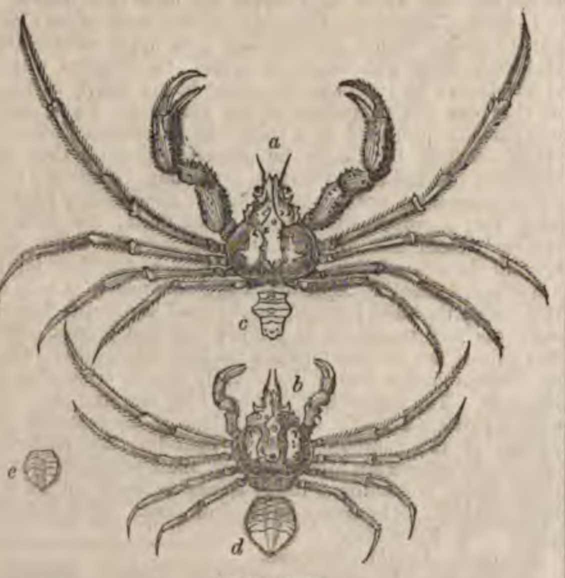
Rostrum very short; disposition of the eyes different from that in the previous genera in the system of M. Milne Edwards, the peduncles being capable of being reflected backwards, and being lodged in an orbitary cavity, which, though not deep, is very distinct. Internal *antennæ* without anything remarkable; the first joint of the external antennæ soldered to the front before the internal canthus of the eyes, and the second advanced on the sides of the rostrum. Epistome rather wider than it is long; third joint of the *jaw-feet* much longer than it is wide, nearly of the form of a triangle with its base in front, and giving attachment to its succeeding joint near its anterior and external angle. *Sternal plastron* narrowed suddenly between the feet of the first pair, and with its length not equal to its greatest breadth. *Feet* of the first pair very small in the female, but very large in the male, and sometimes thrice the length of the body; the claws always pointed and curved inwards. The succeeding feet cylindrical, slender, and more or less filiform; the second pair, always longer than the first, are thrice or four times the length of the post-frontal portion of the carapace; the others diminish successively in length, and all terminate in a very long cylindrical joint, which is pointed and but little or not at all curved. The *abdomen* is composed of only six distinct joints.

Localities and Habits of the Genus.—All the species are small, and have hitherto been found on the coasts of Europe, particularly those of England and France. In the latter country they have been taken both on the northern and Mediterranean shores. They often haunt coves where there are oysters, and all of them have the body covered with down and hairs, to which sponges and corallines attach themselves. Colour brownish. (M. Edwards.)

M. Milne Edwards divides the genus into three sections: the first containing one species, having the stomachal region furnished with five spines or tubercles, including one (median and posterior) very strong, and four small ones anteriorly on a transversal line.

Example, *Inachus Scorpio*.

Locality.—The British Channel, &c.



Inachus Scorpio.

a, male; *b*, female; *c*, abdomen of male; *d*, abdomen of mature female; *e*, abdomen of immature female.

The second section consists of *Inachi dorynchus* and *thoracicus*, and the third of *Inachus leptorhynchus*.

Egeria.

This genus is Asiatic in its geographical distribution, and M. Milne Edwards divides it into two sections; the *first* with the third joint of the external jaw-feet deeply notched at its anterior and external angle (*Egeria arachnoides* and *E. Herbstii*), and the *second* with the third joint of the external jaw-feet not notched at its anterior and internal angle (*Egeria Indica*). [Egeria, vol. ix., p. 304.]

Doclea. (Leach.)

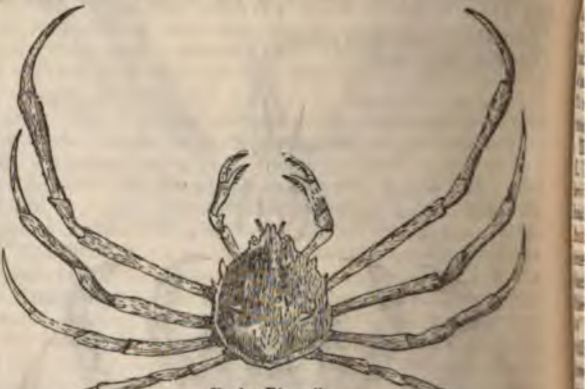
Generic Character.—*Carapace* nearly globular, hairy, and more or less beset with spines; *front* raised, and the lateral edges of the carapace, instead of joining the orbits, directed towards the anterior border of the buccal frame; *rostrum* short and very narrow; the *orbits* directed obliquely forwards, and entirely lodging the eyes, which are very small, and have no trace of a spine at the anterior angle of their upper border, a character which renders them easily distinguishable from the *Libiniæ*. The basilary joint of the external antennæ advances much beyond the internal canthus of the eyes, and terminates nearly in a point under the front, to which it is intimately united; the second joint of these antennæ is short and placed near the edge of the rostrum; the third and the fourth joints are very small. *Epistome* very little developed, and much wider than it is long. The third joint of the external jaw-feet is nearly square, slightly dilated outwards, and rather deeply notched at the internal and anterior angle. *Sternal plastron* nearly circular; the anterior *feet* weak and very small, not more than once and a half of the length of the carapace, the hand nearly cylindrical. The succeeding feet very long, though not always equalling those of the *Egeriæ*, slender, and cylindrical; their terminating joint long and styliform; the second pair from twice to thrice as long as the post-frontal portion of the carapace, and the succeeding pairs diminishing progressively. The *abdomen* varies; sometimes only five distinct joints are to be detected in that of the female; sometimes there are seven, as in the male.

M. Milne Edwards, who gives the specific character here stated, observes that the *Docleæ* bear the greatest analogy to the *Egeriæ*, and establish the passage between those *Macropodians* and the *Libiniæ* which belong to the tribe of *Maiians*. [Maiidæ.]

Geographical Distribution of the Genus.—Where known, the Indian Seas.

Example, *Doclea Rissonii*.

Locality unknown. (*Hist. Nat. des Crustacés.*)



Doclea Rissonii.

MA′CROPUS, the scientific name for the Kangaroos. [Marsupialia.] The term is also used by M. Latreille to designate a genus of brachyurous decapod crustaceans. [Macropodians.]

MACRORHAMPHUS. [Scolopacidæ.]

MACROURA, or MACRU′RA, the scientific name for that section of Crustaceans which have the abdomen, usually called the tail, long in contradistinction from that section (*Brachyura*), which have the tail short. The common lobster is an example of a Macrurous crustacean, and the common crab of a Brachyurous crustacean. [Crustacea, vol. viii., p. 197.]

MADAGASCAR (called by the natives Madecasse), a large island in the Indian Sea, about 240 miles from the coast of Mozambique on the eastern shores of Africa, extends from 12° S. lat. to 25° 45′ S. lat., and between 43° and 51° E. long. From north to south, between Cape Ambré, or Natal, and Cape Mary, or Romain, it is 960 miles long with a width varying from 200 to 500 miles: it is estimated to cover a surface of 225,000 square miles, or somewhat more than the extent of France. It is separated from the continent of Africa by the Channel of Mozambique.

Though a short description of this island occurs in Marco Polo, and it was discovered by the Portuguese in 1506, we are still very imperfectly acquainted with its natural features and riches. It is stated that a mountain-range traverses the island in its whole length, and that some of the summits rise to an elevation of 10,000 or 12,000 feet. Its offsets cover the greater part of the interior, and in some places approach to the very shores of the sea, especially along the western coast between Cape Passadava and Cape Ambré, where the stupendous peak of Matowla raises its head not far from the shore, and also south of Cape St. Andrew in different places. But between Cape St. Andrew and Cape Passadava a low marshy plain extends along the shore, and runs 60 or 80 miles inland. This part of the coast is indented by bays, harbours, and rivers, admirably adapted for commerce, but they are all neglected, with the exception of Bembatooka. The eastern coast seems to be high and rocky from Cape Ambré to the large bay of Antongil, one of the most spacious harbours of the Indian Sea. South of this bay the shores are low and swampy to a distance inland varying from 10 to 40 miles, and extremely unhealthy. In the interior the country in many places contains extensive plains, which are excellent pasture-ground, and frequently possess a soil adapted to all kinds of tropical plants.

Bambatooka Bay, on the western coast, is the æstuary of several rivers. It is 17 miles deep and three and a half wide at the entrance; but inside it is nearly eight miles wide. Bambatooka itself is an inconsiderable village, but Majunga, on the north side of the bay, is a large town and the harbour of Thanaan-arive, the capital of the Ovahs, the most powerful, industrous, and civilized nation of the island. Vessels drawing 15 feet water can proceed to Majunga and 15 miles up the bay. From this point to the mouth of the river Betsibooka, a distance of 10 miles, there is an extensive lagoon, deep enough to be navigated by vessels of considerable burden; in spring-tides the water rises 20 feet at the mouth of the river. From its mouth to Thanaan-arive is a distance of 245 miles by the road. Boats sail 160 miles up the Betsibooka; from the point where the navigation terminates merchandise is carried overland to Thanaan-arive, a distance of about 85 miles. Following the road from Majunga along the Betsibooka to the capital, the country is low and swampy for 60 miles, but well adapted to the culture of rice: 40 miles farther, the land is more elevated and the rafia tree (Sagus rafla) abounds. Then for 70 miles a barren country intervenes, and the remaining distance of 75 miles to the capital is rather a level country, in which rice, sugar-cane, and cotton are cultivated.

Thanaan-arive is situated in 18° 56′ S. lat. and about 47° E. long., at an elevation of about 4000 feet above the sea-level. In 1817 it had more than 80,000 inhabitants, but has since much increased. It contains some well-built houses, and a few in the European fashion have been erected in modern times, under the reign of Radáma. It does not seem that there is a frequent communication between this place and Tamatave, a seaport on the eastern coast (18° 10′ S. lat. and 49° 31′ E. long.), which has a good anchorage with a hard and sandy bottom. The entrance to Tamatave however is between reefs, and ships are exposed to easterly winds. It carries on some commerce, though it was destroyed by the French in 1819.

South of Tamatave is the mouth of the river Manooroo, or Mangarow. It traverses an extensive country, which is generally level and of great fertility, and contains extensive pastures. The Mangarow seems to be the most important river which descends from the eastern declivity of the interior mountain-range.

According to all accounts the climate of Madagascar is not so hot as might be expected from its geographical position. The elevated range in the interior, and the wind constantly blowing from the sea, render the heat supportable. The interior is very healthy, but the low swampy coast, which contains numerous lakes, and in certain seasons large sheets of stagnant water, is as destructive to the health of Europeans as any place in the East or West Indies. The year is divided between the dry and the wet seasons. The first occurs when the sun is in the northern hemisphere, and then the south-east monsoons prevail. During the north-west monsoons, which blow when the sun is in the southern hemisphere, rains are abundant, and sometimes incessant for several days.

It seems that Madagascar contains a very large proportion of fertile soil, and will produce nearly every kind of grain. Rice is the principal object of agriculture; there are eleven varieties indigenous in this island, and it is cultivated either on high or low ground, but with little care. Other plants which are raised are manioc, or cassava root, Indian corn, and sweet potatoes. These plants have been imported, and their culture spreads more and more over the island. Indigenous plants used as food are the prickly yam (*Dioscorea aculeata*), and another species (*Dioscorea bulbifera*), the eatable arum, or bread fruit, and many varieties of plantain; also the *Maranta Madagascariensis*, which produces arrow-root, and is very nutritious. The *Sagus rafia* is much cultivated on account of its leaves, the fibres of which are ingeniously woven into cloth which is worn by the greater part of the natives. The dresses of the higher classes are manufactured of silk or cotton. The silk-worms of this island are of a large size, and suspend their cocoons from the branches of trees. They feed on the leaves of *Cytisus Cajan*, or Pigeon-pea, which is indigenous in Madagascar. Of the sugar-cane there are also several indigenous varieties. The fruits of the allspice of Madagascar (*Agathophyllum aromaticum*), of the grand cardamum (*Amomum angustifolium*), and the negro-pepper of the Indies (*Capsicum frutescens*) are used as condiments. By an incision into the bark of the *Urania speciosa*, a glutinous juice is obtained which is very nourishing; and the leaves of this tree are used in building and thatching houses. There are eleven varieties of tobacco indigenous in this island. Coffee has been introduced by the French, and succeeds very well. The cocoa-nut tree and the mangrove abound along the shores.

Only cattle, sheep, fowls, ducks, and geese are kept. Wild swine are numerous, and on the western coast it is stated that wild cattle are found, some of them without horns. The large wild animals of the African continent are not met with, but macaucos, caimans, and serpents abound.

The mineral wealth of the island is not much known. It is certain that iron-ore, potters' clay, plumbago, and tin abound; and it is stated that silver and copper also occur in the mountains.

The population is estimated to amount to between four and five millions. The inhabitants seem to belong to different races, which have mixed together, and speak only one language, which contains a great number of Malay words. The inhabitants of the shores are short, rather darker than mulattoes, with low foreheads, broad and flat faces, and large eyes and mouths. Their hair is long but crisped. The Ovahs, who inhabit the elevated plains in the interior, are in height rather above the European standard, portly in their person, and of all shades of colour from deep black to copper (the latter colour however is prevalent), and their hair is long and lank. The Madegasses have made considerable progress in the arts of civilization, which is evinced by the houses they build in a climate which does not require such substantial dwellings. In agriculture and the arts connected with it they are perhaps not inferior to the inhabitants of Java, and certainly not to those of Sumatra. The Ovahs are distinguished by their superior skill in manufacturing silk and cotton dresses, in forging iron, which they apply to various purposes, from the blade of a lance down to a needle, and in the making of silver and gold chains, balances, and other articles, in which great ingenuity is displayed Their language is written in the Arabic character. Their religion is idolatry, not founded on any sacred writings; a circumstance which may partly explain why the exertions of the Christian missionaries who have been sent to this island in recent times have been more successful here than in most other countries. It appears that by a royal edict of 1835, the public profession of Christianity was forbidden in the island. Those who violated the edict have been punished with confiscation of their property; and the married men who professed Christianity have been sold into slavery, with their wives and children. One native woman, after being in vain menaced, with the view of inducing her to impeach her companions, endured an ignominious and cruel death (August, 1837) with all the constancy of a Christian martyr. (*Missionary Register*, Jan. 1838.)

Madagascar is said to be divided into twenty-two states, governed by kings; but in the present century most of them were subjected to the sway of the Ovahs, by King Radáma, who died in 1828. This extraordinary man, who in energy of character resembled Peter the Great, introduced into his country the arts and civilization of Europe. He established a communication with the English in the island of Mauritius. He received and protected the missionaries, and promoted the establishment of schools, the number of which at the time of his death had increased to more than 100, in which nearly 5000 children were i structed. Several young people were sent to the Mauritius and even to England to receive instruction. European mechanics were well received and employed by Radáma. He introduced into his army the discipline and arms of the English. Besides the Ovahs, the Seclavas have distinguished themselves, but only as pirates. They inhabit the north-western shores, from whence they send fleets consisting of several small vessels to the Comoro Islands and even to the coast of Mozambique for the purpose of making slaves; but since the abolition of the slave trade, which Radáma, their conqueror, effected at the request of the English, their excursions have been less numerous and destructive. Still however slavery exists in Madagascar.

The French alone have tried to establish colonies on this island. The first attempt was made in 1665, and several others were made afterwards. These settlements never prospered, partly on account of the unhealthiness of the low western coast, where they were formed, and partly on account of the warlike character of the inhabitants. Since the return of peace in Europe the French have again made some attempts in two or three places. In 1821 they settled on the Isle Madame St. Mary, which is north of the harbour of Foule Point, and is 31 miles long, and from two to three miles in breadth. This settlement is improving, though the French at first suffered much from the climate. There is another settlement at Foule Point Bay, but it is inconsiderable. There are also small settlements at S. Luce (24° 44′ S. lat.), and on the tongue of land called Tholangar (25° 10′), where the French have built a small fortress, called Fort Dauphin. In these establishments the French cultivate sugar, coffee, and other tropical productions, which are sent to the island of Bourbon. The English of the Mauritius fetch from the harbour of Tamatave, rice, cattle, tortoise-shells, amber, and some minor articles. Some parts of Madagascar keep up a commercial intercourse with the southern coasts of Arabia.

(Owen's *Voyages to explore the Shores of Africa, Arabia, and Madagascar;* Locke Lewis's 'Account of the Ovahs,' in the *London Geographical Journal*, vol. v.; and *History of Madagascar*, by the Rev. W. Ellis.)

MADDALO'NI. [LAVORO, TERRA DI.]

MADDER (*Rubia tinctorum sativa*, Linnæus), a plant which is cultivated in particular districts for the roots, which produce a fine red dye. It was formerly more extensively cultivated in England than it is now, when it can be imported at a less expense than it can be raised. It requires a very rich and deep soil, and much labour and attention, besides occupying the ground for three years before it comes to perfection.

Any soil which is deep and dry, and in which there is a good proportion of humus, will suit this plant. A rich loam, inclining to a sand, in which the roots can spread and swell, while they find sufficient nourishment, is preferable to the stiffer soils. If it has lain for a considerable time in grass before it is ploughed up, it will be all the better.

The preparatory tillage of the land must be such as to pulverise the soil to a great depth, and so mix the manure, which must be abundant, with every part, that, wherever the roots spread, they may find sufficient nourishment. The land is usually laid in beds, with deep intervals dug out with the spade, somewhat like asparagus beds. The width of these beds differs according to the natural moisture of the climate; in Belgium they are only three feet wide; and that width seems the best for a moist climate like that of England, except upon very light soils, where a greater width may be more advantageous. Trenching with the spade is generally preferred to ploughing, and is most economical in the end; for, however well and deep the land may be ploughed, it must be forked or dug over again several times before the plants are put in.

The manure used for madder must be well rotten and mixed with earth in a compost a considerable time before it is used. Good stable dung which has heated to a certain degree, and been turned over two or three times before it is mixed with earth, is the best. This earth should be sods taken from water-furrows in meadows and laid in a heap for some time. The dung should be put in layers with this earth, and if the whole can be well watered with urine or the drainings of the yard, and then mixed up by the spade, the compost will be much superior to fresh dung alone. This should be ploughed or dug in before winter. In spring another tillage may be given to destroy all weeds, and make the soil uniform to the depth of two feet at least. The land, having been harrowed flat, may now be laid into narrow beds by digging out the intervals with the spade; the surface being raked or harrowed smooth, the planting may begin.

The plants are raised in a seed-bed, or they are shoots and suckers from old plants. The first are a twelvemonth old from the sowing. The seed should be fresh; for if old seed is sown, it may not rise the first year. When a good variety of madder has been in cultivation, the shoots are preferred to seedlings; but when there is any appearance of the plants degenerating, a fresh sowing is had recourse to.

The suckers or shoots are taken off from the crown of old plants, when they have thrown out fibrous roots. They will then readily grow if transplanted. In southern climates this is done in autumn or winter, that they may not be scorched by the summer's heat. In northern climates June or July is the proper season, as there is never a deficiency of rain at that time. They may be also planted in February or March, if the ground is ready and dry: a showery time is advantageous. The plants are put in by means of a dibble, or rather a narrow trowel, which opens the soil, and then lets the earth fall upon the roots; a slight pressure sets them firmly in the ground. On a three-foot bed there are only two rows about 16 inches apart, and each 10 inches from the side. They are set by a line, from four to six inches from plant to plant in the rows. A watering with diluted urine, after sunset, greatly assists their taking root.

In some places the madder plants are put in with the plough. A deep furrow is drawn, and the plants are placed against the furrow slice turned up; the return of the plough covers them, and makes a fresh bed for the next row. This may do on very rich, dry, light loams, but would not be advisable in heavier and moister soils. At every eighth or tenth furrow a water-furrow should be ploughed out, and deepened with the spade: with these precautions the plants may thrive, and a great saving may be made in the labour when a considerable amount of madder is planted.

When the madder plants begin to grow, they must be well weeded and earthed up with the hoe. Liquid manure should be poured into the intervals, and the earth impregnated with it thrown around the plants.

The same attention to weeding and earthing up must be continued till the roots are fit to be taken up, which is in the third year.

The stems and leaves of madder are often cut as fodder for cattle, which are very fond of them: it is said that the colouring matter is so penetrating, that the bones of cattle fed on madder for a considerable time have been found tinged of a red colour. This practice however is not to be recommended, as it must injure the growth of the root, which is the valuable part. When the roots are taken up it is best done by means of a fork, so as not to break or cut them. The earth is loosened all around, and the roots laid bare. They are carefully taken out of the ground without breaking them, and laid on the surface to dry partially and become tough, after which they may be gathered into heaps under a shed, or protected from the weather by straw, if it be rainy. They are afterwards dried in a kiln, and are then fit to be sold to the dyers. If the quality is good, the root on being broken has a bright red colour verging towards purple. A yellow hue indicates inferiority. The produce of an acre of madder is from 10 to 20 cwt. If the rent and expenses of three years are taken into consideration, and the manure and labour required, it will be readily seen that unless the price be 4*l.* per cwt. it will not pay so well as a common crop of potatoes, carrots, or parsnips, which will not require so good a soil nor so much manure. This is a sufficient reason for the decrease of the cultivation of madder in England. In some particular instances great profits have been realised by madder; but the demand is limited, and the price fluctuates so much, that it is not a crop to be recommended, except in peculiar situations and circumstances.

Chemical and Colouring Properties of Madder.—The root is the only part of the plant used for the purpose of dyeing: it is subjected to the operations of picking, drying, freeing from the earth and epidermis, and powdering. The powder is of a yellowish-red colour, and contains three different colouring matters, two of which, *alizarin* and *purpurin*, are red, and one, *xanthin*, is yellow. *Alizarin* (from *alizári*, the Levant name for madder) is obtained by gradually mixing madder in fine powder with an equal weight of sulphuric acid, and allowing the mixture to remain for some days; by this all the vegetable products but alizarin are carbonized; the residue is to be washed with water to separate the acid, then dried, and treated first with alcohol to separate a little fatty matter, and afterwards with repeated portions of boiling alcohol, which dissolves the alizarin; this alcoholic solution is to be treated with water, the alcohol to be separated by distillation, and the residual liquor being thrown on a filter, the alizarin remains on it.

The alizarin may also be separated from the charred mass after it has been washed with water and alcohol, and dried by exposing it to a temperature of about 480° Fahr.; the alizarin then sublimes, and concretes in long brilliant needles of a very fine red colour.

The properties of alizarin are—that it is inodorous, insipid, neutral to test papers, very slightly soluble in cold water, and but little is dissolved by it even when boiling; it dissolves in alcohol and æther in all proportions; the aqueous solution is of a pure rose-red colour, and the æthereal solution is of a fine golden yellow. Diluted acids do not dissolve it, but concentrated sulphuric acid readily takes it up, and the solution is of a blood-red colour, from which water throws down the alizarin; concentrated nitric acid decomposes it, but chlorine acts feebly upon it.

Ammonia, potash, and soda, and their carbonates, all dissolve alizarin, and yield with it solutions of a most beautiful violet colour. Alizarin combines readily with various tissues which have been mordanted, and forms with them very fixed colours, which resist even the action of soap and boiling water. It is stated to be composed of 20 hydrogen, 18 carbon, and 62 oxygen.

Purpurin.—In order to obtain this, madder-root is to be treated with a solution of carbonate of soda till it ceases to yield colouring matter; it is then to be washed, and treated for some hours with a hot solution of alum; a little sulphuric or hydrochloric acid is then to be added, which occasions a precipitate of a fine slightly-orange red colour; this, after being collected and washed on a filter, and treated with alcohol, yields a solution which, when subjected to distillation, deposits purpurin. The properties of this substance are—that it is but little soluble in water, whilst alcohol, especially when hot, and æther, both hot and cold, dissolve it readily; the alcoholic and æthereal solutions are of a brilliant cherry-red colour, and yield by spontaneous evaporation acicular crystals of four to five lines in length. This substance is distinguished from alizarin not only by difference of colour, but because it is soluble in a solution of alum, and insoluble in carbonate of soda and protochloride of tin; it dissolves in this last solution by the addition of a few drops of potash. The colours which it imparts to different tissues are of a reddish or purple tint, and are extremely brilliant, but less durable than those of alizarin.

Xanthin, or the yellow colouring matter of madder, is obtained by very tedious processes; it possesses the smell of the root, is very soluble in water and alcohol, but less so in æther. It forms red compounds with bases. Concentrated sulphuric acid renders a solution of xanthin green, and precipitates a powder of this colour, which is soluble in water. According to Berzelius it is most probably modified alizarin.

Madder yields colours of the greatest permanence. It is employed for dyeing linen and cotton red, and two kinds of it are fixed on cotton; one is called simply madder red, and the other, which possesses a much higher degree of lustre and fixedness, is called Turkey or Adrianople red, because it was for a long time obtained from the Levant. It does not afford a colour of sufficient brilliancy for dyeing on silk, and linen takes it with greater difficulty than cotton. It is also employed in calico-printing and in the preparation of madder lakes.

Independently of the colouring principles above described madder contains lignin, gum, sugar, resin, a bitter substance, a vegetable acid, vegeto-animal matter, and salts.

Trade in Madder and Madder Roots.—The quantity of this dyeing stuff imported in its natural state and ground, in each of the ten years from 1829 to 1838, has been as follows:—

	Madder Root. Cwt.	Ground Madder. Cwt.	Total. Cwt.
1829	33,541	70,017	103,558
1830	37,074	51,624	88,698
1831	52,449	43,935	96,384
1832	54,449	79,435	133,884
1833	56,662	61,397	118,059
1834	80,296	72,003	152,299
1835	66,323	94,102	160,425
1836	85,251	108,906	194,157
1837	109,235	84,841	194,076
1838	73,669	97,443	171,112

Nearly the whole of these importations are obtained from Holland, France, and Turkey. In 1837, the latest year for which we have such particulars, there were brought from Holland 34,279 cwt., nearly all of which was ground; from France we received 102,574 cwt., of which about one-half was in the like state of preparation; and from Turkey 36,673 cwt. of the unprepared roots. Some small quantities are brought from Spain and Italy. Of late years we have received from 2000 to 3000 cwts. annually from India. The duty chargeable on consumption is 2*s.* per cwt. on the prepared madder, and 6*d.* per cwt. on the roots.

MADEIRA, an island situated in the Atlantic Ocean, between 32° 30′ and 32° 50′ N. lat., and 16° 40′ and 17° 20′ W. long., and about 400 miles from the north-western coast of Africa. It is nearly 45 miles long, and its greatest breadth nearly 20 miles. The area is said to be 360 square miles, or nearly that of Huntingdonshire.

This island is one mass of basalt, rising with a rather steep ascent from the south and from the north towards the interior, where the highest part of the mass runs from south of east to the north of west, between Cape de S. Lourenço on the east to Cape de Pargo on the west. This, the most elevated portion of the rock, rises to 4000 and 5000 feet: the Pico Ruivo, the highest summit, attains 5993 feet above the sea-level. Both declivities of the mountain-mass are furrowed by deep and generally narrow valleys and depressions, traversed by streams of clear water. These valleys contain the gardens and vineyards. The vineyards are formed on the declivities of the rocks, to the height of 2300 feet above the sea. The rocks in most places come down to the very shore of the sea, and enter it with so rapid a descent, that soundings are to be only found close to the shores, and even there on a rocky and unequal ground, and at a depth of 35 to 50 fathoms.

The climate of Madeira is very mild. The mean temperature of the year does not exceed 68°. In the months of December and January the thermometer rarely sinks below 60°; the mean temperature of that season being 63°. The mean temperature of the hottest months (August and September) is between 73° and 74°; but when the eastern and south-eastern winds bring to the island the hot air from the African desert, the thermometer sometimes rises as high as 85° and even 90°. Rain is not confined to a certain season of the year, but occurs at all seasons. Madeira sometimes suffers from hurricanes. The climate is considered very healthy, and many persons in England who are suffering from or in danger of consumption withdraw to it for the purpose of diminishing their sufferings and prolonging their life.

In the lowest region of the island, to about 750 feet above the sea-level, many tropical plants are cultivated, as the date palm-tree, the plantain, two kinds of cactus, the sweet potato, Indian corn, coffee, and the American agave (*Agave Americana*), as well as the sugar-cane, the olive-tree, the pomegranate, and the fig. Above this region, to a height of from 750 to 2500 or 2800 feet above the sea-level, the fruits and grain of Europe, especially wheat and maize, are raised; and in this region are also the extensive vineyards, which furnish the most important article of exportation. Then follows a tract covered with high trees, which rises to 3200 feet and higher, where many plants and trees are found which do not occur in Europe. This region contains also extensive forests of chesnut-trees, the fruit of which is the common food of the inhabitants. Its surface is extremely broken, and bare rocks appear in many places. The highest portion of the rocks is covered with heath, fern, and in some places with fine grass, which preserves its verdure through the greater part of the year, this region being frequently enveloped by dense fogs, and subject to heavy dews.

Few horses are kept, and most of them are imported. Cattle are more numerous, and of a large size. Asses are the most common domestic animals, and best adapted to the roads of the country as beasts of burden. Hogs are rather numerous, as well as fowls. In the interior there are many wild swine and rabbits. Birds are not numerous, and fish is rare, on account of the great depth of the sea which surrounds the island. Salted cod constitutes one of the most important articles of import.

Funchal, the capital, and the only town of the island, is on the southern coast. It has only an open roadstead, with a rocky and very uneven anchorage, in which vessels are exposed to great danger from November to February, when gales from the south-east and south-west prevail. Yet this place is frequently visited by ships bound to S. America, the Cape of Good Hope, or the E. Indies, as a place of refreshment, and from it all the produce of the island is exported. The town consists of a pretty wide street along the sea-shore, where there are several good buildings, and numerous small lanes, which extend to a considerable distance up the slope of the hill. The number of houses amounts to about 2000, and that of the inhabitants to 20,000. The town is defended by four forts, and has eight churches and several convents. In the midst of the town is an open square, planted with exotic trees, as Dracæna Draco, Jasminum azoricum, and Datura arborea.

The population of the island is estimated at 80,000, who are descendants of the Portuguese, but with a considerable mixture of African blood. The number of negro-slaves is still considerable, and was formerly much greater. The inhabitants are a very industrious and enterprising people.

The commerce of Madeira is considerable. The exports are stated to amount to 500,000*l.*, of which about 400,000*l.* in value go to England. The principal article is wine. During the late war, when the Spanish wines were not brought to England, 30,000 pipes were exported from Madeira, according to the statement of Lord Valentia. The importation of Madeira wine into England in 1833 was 301,057 imperial gallons. In 1825 the export was 14,425 pipes, and in 1826, 9391. The wine exported is Madeira wine and Malvasia de Madera. The latter is cultivated on the northern coast, near the village of Machico, and amounts to about one-sixth of the whole quantity exported. Minor articles of export are, fruits, dragon's-blood, honey, wax, orchil, a lichen collected from the rocks and used as a red dye, and tobacco, besides provisions for the vessels bound to more remote places. The imports consist of manufactured goods, corn, fish (herrings and cod), oil, salt-beef, salt, and some tropical productions.

Madeira is said to have been visited by Robert Machin, an Englishman, during the reign of Edward III. It was discovered in 1419 or 1420 by Gonzalves Zarco. It was then covered by an immense forest, whence its name is derived, Madera in Spanish signifying wood. The forest was set on fire, and it is said that the conflagration lasted seven years. Soon afterwards it was settled by the Portuguese, and the culture of sugar and wine was introduced. Sugar was grown to a considerable extent before the islands in the West Indies were settled; but upon that event the culture decreased, and was replaced by that of wine, which now seems to be giving way to coffee.

About 40 miles north-east of Madeira lies the small island of *Porto Santo.* It is a basalt rock, which does not exceed 500 feet in height. Indian corn and vegetables are cultivated for consumption, and a little wine for exportation. The population amounts to about 1200, of whom 600 live in the small town of Porto Santo, the roadstead of which is much exposed to southerly winds.

To the south-south-east of Cape St. Lourenço are three small basalt rocks, lying in a row from north to south. They are called *Ilhas Desertas*, and are only inhabited by sea-fowl, but they are visited from Madeira for the purpose of collecting the orchil, with which the greatest part of their surface is covered.

(Lord Valentia's *Voyages and Travels to India;* Prior's *Voyage to the Indian Seas;* Spix and Martius, *Travels in Brazil;* Holman's *Voyage round the World.*)

MADHOUSE. [LUNATIC ASYLUMS.]

MA'DIA, a genus of South American herbaceous plants of the Composite order, one of the species of which, M. sativa, is of value for the oil yielded by its seeds upon pressure. The genus forms the type of Madieæ, a division of the senecionideous tribe of De Candolle, and is distinguished among its congeners by its roundish one-rowed involucre, the bracts of which are keeled and envelop the grains, by a plane receptacle paleaceous at the margin and naked in the middle, and by its bald achænia, which have four or five angles, and taper to the base. Madia sativa, which forms the only species, is an upright hairy glandular viscid Chilian annual, with oblong entire leaves, half amplexicaul, opposite at the bottom of the stem and alternate at the top; the flower-heads are racemose, and the flowers pale yellow. It has long been cultivated in Chili, and apparently in California, for the sake of its oil, which is of excellent quality. It has lately attracted attention in Europe in consequence of Mr. Bosch, the superintendent of the gardens of the king of Wirtemberg, having successfully cultivated it in Germany on a large scale. He found that as compared with rape and poppies the amount of oil yielded per German acre was as follows:—

Rape	yields	240 lbs.	of oil per acre	German.
Poppies	„	264 lbs.	„	„
Madia	„	442 lbs.	„	„

This oil does not congeal at 19° below zero of Réaumur, but only becomes a little less fluid, which makes it a valuable material for keeping machines in order. The seeds are sown in October, and from four to six pounds are required per acre (German). The crop is of the easiest management, and the only precaution to be taken by the cultivator, which it is important to notice, is that the seeds must be thrashed out soon after the crop is cut, otherwise the glutinous stalks, when heaped up, ferment and injure the seeds. (*Gardener's Magazine*, March, 1839, p. 142.)

MADISON, JAMES, was born on the 5th of March (o.s.), 1751, at the seat of his maternal grandmother, near Port Royal, on the Rappahannock river in Virginia. His parent's home however was then at Montpellier, in Orange County, Virginia, where Mr. Madison always resided.

He received his first instruction from Donald Robertson, a Scotch teacher in King and Queen County, Virginia, with whom he was placed at twelve years of age. During the three or four years that he was under Robertson's care he acquired some knowledge of Greek, Latin, and French, with the elements of mathematics. He afterwards studied about two years at home under the Rev. J. Martin. In 1769 he was sent to the college of Princeton in New Jersey, in preference to William and Mary College in Virginia, which was considered unhealthy to students from the upper parts of the country. In 1772 he took the degree of B.A., to obtain which however it was necessary to compress the studies, which usually occupy two years, into one, a circumstance which so much impaired his health, that it was thought advisable for him to remain in Princeton another winter. He returned to Virginia in the spring of 1773, and commenced a course of reading to prepare himself for the bar; but the dispute between the colonies and Great Britain having then commenced, he was soon induced to take an active part in it. He particularly distinguished himself as a friend to religious freedom by his efforts in behalf of the preachers of the Baptist persuasion, who were then persecuted with great zeal by the established church, and occasionally thrown into prison for preaching in defiance of prohibitory laws. In the spring of 1776 his political career commenced by his being chosen a member of the Virginia convention, which formed the first constitution of Virginia. He continued a member of the legislature till 1777, when he lost his election, in consequence, it is said, of his conscientious refusal to treat the freeholders, according to the practice then prevailing. The legislature however named him a member of the council, in which office he continued two years, until he was appointed a member of congress, in which body he took his seat in the month of March, 1780.

His letters and papers, which will shortly be published, show that he took a very active part in the proceedings of that body during the three years that he was a member of it.

Returning to private life after the peace, he resumed his legal studies, but intermingled them with miscellaneous and philosophical reading. Natural history, to which the genius of Buffon had then given unusual attraction, seemed to have been his favourite branch of science, and he has left some notes of his observations on European and American animals of the same species. In 1784 he was again elected to the legislature of Virginia, and continued a member of that body for the years 1785 and 1786. Here he formed the scheme, and drew up a resolution for that purpose, of inviting the meeting at Annapolis, which led the way to the convention that formed the constitution of the United States. He was one of the three commissioners from Virginia who assembled at Annapolis, where he met Alexander

Hamilton, with whom he was afterwards so closely united in forming the new constitution, and from whom he was so widely separated in carrying it into execution. It should be remarked that he did not offer the resolution which he had drawn up, on account of the jealousy even then entertained by state politicians of the federal authority and those who had been in congress, and it was confided to a member who was exempt from that suspicion.

While he was in the Virginia legislature he drew up the memorial and remonstrance against the project for a compulsory support of religion, which was perhaps made with a view to a permanent establishment; and he succeeded in defeating it. (Tucker's *Life of Jefferson*, chap. 4.) His talents and acknowledged influence at this time were all exerted in favour of a policy as liberal as it was practical and wise. Finding that Kentucky was determined to separate from Virginia, he furthered her purpose, instead of making a fruitless opposition to it. He opposed the attempt to introduce paper-money; he was the efficient supporter of the laws introduced into the code prepared by Jefferson, Wythe, and Pendleton; and he favoured the recovery of the debts due to British creditors. He proposed liberal donations to General Washington and to Thomas Paine: the latter effort failed; the former succeeded; but the donation was refused. He carried on an extensive correspondence at this time with some four or five friends, which gives the best view of the state of Virginia at that period. In the convention which formed the present constitution of the United States he bore a very conspicuous part; and anticipating the interest which future times would take in the proceedings of that body and in the opinions of its members, he was at the pains to keep a record of the debates, the only one extant which is either complete or authentic. He commonly wrote out at night what had been said in the day. After the constitution was formed, he united with Alexander Hamilton and John Jay in recommending it to the American people in newspaper essays, under the signature of Publius, which have been since published under the title of 'The Federalist.' The debates, which he would never consent to publish during his lifetime, congress have lately purchased for 30,000 dollars, and they will soon be published.

After the federal constitution was submitted to the several States for their adoption, Mr. Madison went into the legislature of Virginia, where Patrick Henry headed the opposition to it; and it was to Mr. Madison's cool and powerful reasoning that its adoption in that state was mainly due. If it had failed there, it would have failed altogether. Mr. Madison had also more agency than any other individual in inducing Virginia to make a cession of all her claims to the lands north-west of the Ohio (now comprehending the states of Ohio, Indiana, and Illinois), to which she asserted a right, both under her regal charters and by conquest during the Revolution.

He was chosen a member of the first congress under the constitution in 1789, and contined a member of that body until 1797. In 1794 he married Mrs. Todd, a widow of Philadelphia, whose parents were Virginians, but, being Quakers, had removed to Philadelphia. From this time he felt the strongest inclination to retire from public life, and to devote himself exclusively to the cultivation of letters and science, and the pursuits of agriculture. But his countrymen appreciated his worth too highly to permit him to retire into private life. In congress no one had more weight personally; but soon finding that his views and those of Mr. Hamilton did not coincide as to the principles and spirit in which the federal government should be administered, he separated himself from the administration, and was thus on most great measures in a minority. When the public debt was funded, he made an unavailing attempt to secure to the soldiers and other original creditors the benefits of the rise in value of the public claims, which speculators had purchased at about one-eighth of their nominal amount. This was the first great measure in which he opposed the ministerial policy of which Hamilton was the chief author. He also opposed the unqualified assumption of the state debts by the federal government. After the French revolution broke out, European politics mingled in those of the United States, and for a time gave them their chief form and colour. Mr. Madison, who always inclined to the side of liberal principles, was a warm friend of the Revolution; and though its excesses were more uncongenial to no one than to himself, characterised as he was through life by mildness of temper, humanity, and love of order, yet he considered it as likely in the end to advance the cause of civil freedom, and it therefore had his hearty wishes for its success.

Though thus leading an organized opposition to General Washington's administration, this circumstance for a long time seemed to have no influence on their friendship, and it never produced positive alienation. Before his first term had expired, General Washington, being bent on retirement, conceived the purpose of a farewell address; and after making an outline of his views, he requested Mr. Madison to fill it up. Some years afterwards he greatly enlarged Mr. Madison's draft, which he then submitted to Messrs. Hamilton and Jay, and the document as published is found to contain some of Mr. Madison's original forms of expression. The intimacy and correspondence of these two great men continued until 1796.

After it was known that General Washington would retire in March, 1797, parties prepared themselves for the struggle of electing his successor, the federalists uniting in favour of Mr. Adams, and the republicans in favor of Mr. Jefferson. Mr. Adams succeeded by three votes. When parties were so nearly balanced, each redoubled its efforts for the ascendancy. The administration party prepared two laws for removing dangerous and suspicious aliens, and for punishing libels on the government (called Alien and Sedition Laws), which gave their adversaries a fit occasion to make a powerful appeal to the people. To further this object Mr. Madison, who was now withdrawn from congress, went into the Virginia legislature; and in the session of 1798 prepared resolutions denouncing these acts of congress as infractions of the constitution, and inviting the concurrence of the other States. As some of the States opposed the doctrines, and the subject produced much discussion in pamphlets, in the following year Mr. Madison prepared new resolutions, with a preamble, in which he examines the whole subject in one of the closest and profoundest pieces of reasoning which our language contains. It is thought to have contributed more than anything else to the revolution of parties which soon followed. This Report has since become a text-book for politicians on constitutional law and the relative rights of the States and general government. When Mr. Jefferson was elected president, Mr. Madison was made his secretary of state, and from that time until his retirement his life is comprehended in the history of the United States., But the principal parts which he acted will be briefly noticed here.

His pen was put in requisition in maintaining the claim of the United States to the right of deposit at New Orleans, under the treaty with Spain; in discussing the question of the true boundary of Louisiana; in corresponding with Mr. Rose and Mr. Jackson, ministers of Great Britain, on the subject of the attack on the Chesapeake; in drawing up instructions to Mr. Monroe concerning the treaty with England, and the objections to that which was made; and in corresponding with the American ministers on the French Decrees and British Orders in Council. Besides these official papers he wrote an 'Examination of the Doctrines of National Law' asserted by Mr. Stephens, which is perhaps the most compact piece of logic that he ever produced, and the most satisfactory exposition of the relative rights of neutrals and belligerents that is extant.

In 1809 he succeeded Mr. Jefferson as president of the United States; he obtained 122 votes out of 176. General Pinckney, of South Carolina, his opponent, obtained 47 votes. In Virginia the State appeared at first nearly divided between him and Mr. Monroe, but a majority of the legislature declaring informally a preference for Mr. Madison, the State followed their example.

It is known that after many fruitless efforts to induce Great Britain and France to respect neutral rights, war was declared against Great Britain during his administration, and that it continued with various success until 1815. It is said that Mr. Madison, being aware how unprepared the United States were for war, and anxious to preserve peace as long as it could be preserved consistently with the neutral rights of America, wished to postpone the declaration of war, but was urged into it by Mr. Clay and some ardent spirits whose patience was exhausted. If this be so, had his counsels prevailed, the war would have been prevented, for he has often told the writer of this notice that the administration had afterwards indubitable evidence that the British ministry had decided on revoking the offensive Order in

Council, in which case the principal cause of war would have been removed.

After serving two terms Mr. Madison retired to private life, in March, 1817; and it may be questioned whether the eight years which he served as president were not the least happy of his life. In 1829, when the constitution of Virginia was submitted to revision, he consented to serve as a member of the convention, and no doubt contributed largely to soothe the irritation which the conflict of local interests created. He also acted as a visitor of the university of Virginia, and succeeded Mr. Jefferson as its rector. [JEFFERSON.] Except in the discharge of these duties, he not only held no office after his retirement, but, we believe, never left his county after he quitted Washington. Although Mr. Madison lived to the age of eighty-five, he had a very delicate constitution, and never enjoyed good health. He died on the 28th of June, 1836. His physician said that he had two or three diseases, any one of which was commonly sufficient to shorten life.

Montpellier, his patrimonial estate, is a large tract of good land in Orange County, from which there is a fine view of the Blue Ridge, about twenty miles distant. The house, a large brick building, with a Tuscan portico, was sufficient for himself and his father. He was much visited in his retirement. His character and former station attracted many visitors, and his almost juvenile spirits and delightful conversation, with the very pleasing manners of Mrs. Madison, often tempted his guests to protract their visits longer than they had intended. His visitors thus became a tax on his purse, which he very seriously felt, and which compelled him from time to time to sell portions of his land. Though he was incapable of giving an active superintendence to his farm, he managed it with great judgment and with tolerable success.

In person Mr. Madison was below the middle size; though his face was ordinarily homely, when he smiled it was so pleasing as to be almost handsome. His manner with strangers was reserved, which some regarded as pride, and others as coldness; but on further acquaintance these impressions were completely effaced. His temper seemed to be naturally a very sweet one, and to have been brought under complete control. When excited, he seldom showed any stronger indication of anger than a slight flush on the cheek. As a husband Mr. Madison was without reproach. He never had a child. He was an excellent master, and though he might have relieved himself from debt, and secured an easy income, he could never be induced to sell his slaves except for their own accommodation (to be with their wives or husbands). The writer has sometimes been struck with the conferences between him and some trusty servant in his sick chamber, the black seeming to identify himself with his master as to plans of management, and giving his opinions as freely, though not offensively, as if conversing with a brother. Mr. Madison has more than once told the writer that he should have been a great gainer in a pecuniary point of view if he had many years before emancipated his slaves. It was his deliberate conviction that the colonization of the slaves in Africa was practicable. He endeavoured to keep aloof from party feelings, but regularly read the newspapers, and remembered their contents better than most people. Though he was cautious in expressing his sentiments, he could not forbear taking the liveliest interest in public concerns, especially in those of the general government, towards which he seemed always to feel a parental solicitude. He stood well with all parties, and was solicitous so to stand, both from a sense of duty and a love of popularity. Of all the present public men Mr. Clay seemed to be his favourite. He felt great solicitude about the irritating discussions between the North and South on the subject of slavery, and remarked that Mr. Clay had been so successful in compromising great questions, he wished he could have done something on this; and then, he added, 'perhaps all parties would join and make him president.'

With great powers of argument he had a fine vein of humour; he abounded in anecdote, told his stories very well, and they had the advantage of being such as were never heard before, except perhaps from himself. But distrusting the infirmity of old age, he would often say, 'I believe I have told you this story before.' Such were his conversational powers that to the last his house was one of the most pleasant to visit, and his society the most delightful that can be imagined. Yet more than half his time he suffered bodily pain, and sometimes very acute pain. He left pecuniary legacies to some nephews and nieces; 1500 dollars to the university of Virginia, about 3000 or 4000 to the Colonization Society, and the rest of his property, in value above 100,000 dollars, to Mrs. Madison. His writings will be published in six volumes (exclusive of the Debates of the Convention): vol. i., Papers relative to the Old Confederation and Constitution of Virginia, Letters to Jefferson, Monroe, Washington, &c., down to 1789; ii., Letters to the same and others during the Administration of Washington and Adams; View of the Policy of these Administrations; Conversations with Washington, &c.; iii., Letters to Foreign Ministers, Heads of Departments, Presidents, &c., showing the Policy of the Jefferson and Monroe Administrations; iv., Letters and Writings on Constitutional Subjects; v., Essays and Letters on Political Economy, the Law of Nations, Natural History, &c.; and vi., Miscellaneous. (*Communication from Virginia.*)

MADOC, the second son of Owen Gwynnedd, prince of Wales, is said by some authors to have discovered America long before Columbus. The Welsh chronicles are said to state, that Madoc, having been compelled by civil disturbances to leave his native country, set sail in 1170 with a small fleet, and directing his course westward, landed after some weeks on a continent which produced abundantly the necessaries of life, and the inhabitants of which differed greatly from those of Europe. After remaining in the country a long time he left there 120 persons, and returned to Wales, where he equipped a fleet of ten vessels, and set sail again, but was never afterwards heard of. Some of those who adopt this narrative suppose Madoc to have landed on the coast of Virginia or Carolina, and support it by an account of the discovery of an Indian population in North America who spoke the Welsh language. If however there is any truth in the story, Madoc probably landed in a higher latitude than Virginia. See Filson's 'Discovery, Settlement, and present State of Kentucky; with an Account of the Indian Nations within the United States,' London, 1793, 8vo.; also Bertuch, 'Ephémérid. Géograph.,' September, 1819. The above narrative of Madoc's voyage (which has been copied by Hakluyt in the third vol. of his 'Voyages') is given in the 'Historie of Cambria, now called Wales, a part of the most famous Yland of Brytaine, written in the Brytish language, above 200 years past, by Caradoc; translated into English by H. Lloyd, gent.; corrected, augmented, and continued out of records and best approved authors, by David Powell,' London, 1584, 4to. Owen's 'British Remains' (London, 1777, 8vo.; 1785, 12mo.) contains 'An Account of the Discovery of America by the Welsh 300 years before the voyage of Columbus,' written by Dr. Plott. Herbert, in his 'Travels,' defends the claims of his countryman Madoc as the discoverer of the New World with more warmth perhaps than good sense. But the Northmen are said to have discovered America some time before the date of Madoc's alleged voyage; and this fact appears to be established by evidence of a much stronger kind than that of the expedition of the Welsh prince.

(*Biog. Univ.*; *Journal of the London Geog. Soc.*, vol. viii., p. 114.)

MADOX, THOMAS. Of the personal history of Madox little is known. He resided in the Middle Temple. He always writes from the Middle Temple. Thomas Madox of London was called to the bar by that Society in 1704, and the son of a clergyman of Wales of the same name, in 1705. His first work appeared in 1702, entitled 'Formulare Anglicanum; or a Collection of antient Charters and Instruments of divers kinds, taken from the originals, from the Norman Conquest to Henry VIII.': to which is prefixed a very learned dissertation on antient charters and instruments. In 1711 he published his great work, entitled 'The History and Antiquities of the Exchequer of the kings of England, in two periods: from the Norman Conquest to the end of the reign of King John; and from the end of the reign of King John to the end of the reign of Edward II., taken from records: together with a correct copy of the antient dialogue concerning the Exchequer, generally ascribed to Gervasius Tilburiensis; and a dissertation concerning the most antient great roll of the Exchequer, commonly styled the Roll of Quinto Regis Stephani.' This work, which was reprinted in two vols. quarto, with the valuable addition of an index, in 1769, begins with a dedication to the queen, followed by a long prefatory epistle to Lord Somers, in which the author says, 'The records which I here vouch were taken by my own pen from the authentick membranes, unless where it appeareth by my references to be otherwise, and except haply in two or three instances, which it is not material to recollect; and in giving an account of the antient state of the Exchequer, I have for the most part contrived, as far as the subject-matter would permitt, to make use of such memorials as serve either to make known or to illustrate the antient laws and usages of this kingdom: for which reason the present work may be deemed not only a history of the Exchequer, but likewise an apparatus towards a history of the antient law of England.' This epistle concludes with 'a large digression concerning the Romanick dialect.'

The 'History of the Exchequer' treats of the court of the kings of England during the two periods comprised in it, its great offices, the jurisdiction of the king's exchequer, its officers and business; of the exchequer of the Jews, showing the peculiar mode in which they were governed and protected as 'the king's villeins;' of the different sources of the royal revenue, fully considered in all its branches; the whole illustrated by references to an immense mass of documents. The dialogue concerning the exchequer (which Mr. Madox ascribes to Richard Fitz-Nigel, bishop of London), treats, in the form of questions put to the author and his answers, of the functions of the different officers of the exchequer in the reign of Henry II., and of some other miscellaneous matters, in the first book, and of the mode of collecting the king's revenue in the second. It is preceded by an epistolary dissertation addressed to Lord Halifax. The dissertation, with which the volume concludes, relating to the great roll of the exchequer, commonly called the roll of Quinto Stephani, is addressed to Lord Somers. It has lately been ascertained by that eminent antiquarian the Rev. Joseph Hunter, that this roll ought to be referred to the 31 Henry I., a discovery which has removed some of the obscurity in which this part of the reign of Stephen is involved. Though Madox doubted whether this roll belonged to the reign of Henry I., Stephen, or Henry II., yet in his table of the barons of the exchequer from the Conquest, subjoined to the 'History of the Exchequer,' all who are placed in the list in the time of Stephen are so placed upon the supposition that it relates to the 5th year of that king, at which time many of these barons were and long had been the adherents of the rival claimant of the throne, the empress Maud.

In 1726 Mr. Madox published his 'Firma Burgi, or an Historical Essay concerning the cities, towns, and boroughs of England, taken from records.' A posthumous work from the pen of Mr. Madox, entitled 'Baronia Anglica,' a history of the land-honors and baronies, and tenure in capite, verified by records, in which he corrects the errors into which Lord Coke and others have fallen in the use of these terms [MANOR], appeared in 1736, and, with merely an alteration of the date in the frontispiece, in 1741.

Mr. Madox was indefatigable and successful in collecting his materials, and skilful in arranging them, but he has left it for others to apply them to the political and statistical history of the kingdom. A large body of documents, collected as materials for the works which he prepared for publication and for others which he projected, were deposited by his widow in the British Museum.

Mr. Madox held the office of historiographer royal.

MADRAS, one of the presidencies into which the British empire in India is divided. It comprehends the whole of the peninsula of Hindustan south of the river Krishna, and some territory on the north side of that river acquired from the Peshwa, and the province called the Northern Circars. The whole of this great territory, the area of which is upwards of 160,000 square miles, with nearly fourteen millions of inhabitants, is under the immediate government of the governor and council of Madras, but subordinate to the authority of the governor-general of India and his council.

The several districts contained within this presidency are —Northern Arcot, Southern Arcot, Bellary, Canara, Chingleput, Northern Circars, Coimbatore, Cuddapah, Dindigul, Ganjam, Guntore, Masulipatam, Madura, Matabar, Nellore, Rajahmundry, Salem, Seringapatam, Shevagunga, Tanjore, Tinnevelly, Trichinopoly, and Vizagapatam.

The gross revenue collected within the presidency in the three years from 1833-34 to 1835-36 was as follows:—

1833-34	£4,358,208
1834-35	4,480,025
1835-36	4,599,261

The value of the imports and exports from and to all parts of the world in the year 1835 was—

Imports	£1,311,404
Exports	1,955,697

The greater part of this trade was maintained with the other British presidencies and Ceylon. The trade with Great Britain was valued at—

Imports	£224,031
Exports	326,786

MADRAS, or FORT ST. GEORGE, the capital of the southern part of British India, is situated on the Coromandel coast, in the Bay of Bengal, in 13° 5′ N. lat. and 80° 21′ E. long. Madras is in an open roadstead, and peculiarly ill adapted for a place of trade on account of the rapid current which runs along the coast, and the dangerous surf which beats against the shore. This surf is so violent that a peculiar kind of boat is necessarily employed for communicating between ships and the shore. These boats are large and very light; they are made by sewing planks together with straw between the seams, so that they yield to the shock without breaking when thrown upon the shore. They require to be managed with great dexterity by persons well experienced. Boats that belong to the ships, and which are built in the ordinary manner, are not allowed to approach nearer to the shore than the back of the surf, where they anchor and transfer their passengers or lading of goods to the Madras boats already described. In rough weather even these boats cannot venture out, and all intercourse with the shipping is stopped except by means of a contrivance called a catamaran used by fishermen. These catamarans are made with two or three logs of light wood, each about ten feet long, lashed together. They are each managed by two men using paddles. It is very common for these men to be washed off from their vessel, which they regain by swimming. This is a service of much danger, not only for the reason just stated, but because of the sharks in the Bay of Bengal, by which the men are frequently attacked.

Fort St. George stands within a few yards of the sea. It was begun in 1639 by Mr. Francis Day, who obtained permission for the purpose from Sree Rung Rayeel. This fortress was soon surrounded by a town, which has since become very populous; the inhabitants in 1822 were ascertained to amount to 462,000. With the exception of one handsome street in the north-east quarter of the town, the whole is inhabited by natives. The street here mentioned contains the dwellings of Europeans, but the greater part of the English merchants and officers reside in what are called garden-houses in the neighbourhood of the city. The government-house is a handsome building, adjoining the esplanade. The native population for the most part reside in streets placed to the north and east of the fort, from which they are separated by a spacious esplanade.

Fort St. George was taken in 1746 by a French force under M. de la Bourdonnais, who obtained on that occasion a booty of 640,000*l*. On this occasion every British inhabitant was compelled to leave the place. It was restored to the English at the peace of Aix-la-Chapelle. It was again attacked by the French under M. Lally in 1758, but after investing the fort for nine weeks they were obliged to raise the siege and retire with considerable loss. Madras has since been threatened with attacks by Hyder Ali in 1767 and 1781, but has never again been actually besieged.

Madras is 1030 miles from Calcutta, 758 from Bombay 1158 from Agra, 1103 from Benares, 1275 from Delhi, 352 from Hydrabad, and 1661 from Lahore, all travelling distances.

MADRASTRÆA. This name is given by De Blainville to a subsection of the Madrephylliæa, including Astræa, Echinastræa, Oculina, and Branchastræa. He attaches but little importance to it as a division. [MADREPHYLLIŒA.]

MADREPHYLLIŒA, the first section of the Stony Zoantharia of Blainville, who styles the other section of this family of Zoantharia MADREPORÆA. The Linnæan genus Madrepora included nearly all the species, and obviously required analysis, the more so that geological naturalists referred to the same genus a vast number of previously unknown forms, and thus encumbered recent and impeded fossil zoology, and prevented any right notion of the successive forms of zoophytic life on the globe.

Solander proposed some useful divisions of this unmanageable genus, derived from the growth of the coral

Lamarck established many important genera, especially characterising some fossil groups; Lamouroux also laboured to improve the classification. Of late years Goldfuss has described additional fossil groups; and M. de Blainville has reorganised the labours of his predecessors, with a special regard to the soft animal parts figured and described by Lesueur, Quoi, Gaimard, and other voyagers.

The Madrephylliœa of this writer seldom acquire that highly ramose figure which belongs to the Lamarckian genera Madrepora, Pocillopora, &c.; they are furnished with cells of various figure, always however radiated by lamellæ, which are frequently numerous. There is no general distinctive character of the soft parts, or 'polypi,' as they have usually been termed.

GENERA.

Cyclolites (fossil).

Animal unknown; solidified by a calcareous *polyparium*, of a short, simple, orbicular, or elliptical figure, flattened, and marked with concentric lines below, convex above, with a great number of very fine entire lamellæ, convergent to a sublacunose centre.

Lamarck founded the genus; Goldfuss includes it with the Fungiæ. Only fossil species are known; they occur in the tertiary and upper secondary strata chiefly; Mr. Lonsdale notices it in the Silurian system.

Example. Cyclolites numismalis (Madrepora porpita, Linn.). Goldfuss, tab. 14, fig. 4, a, b.

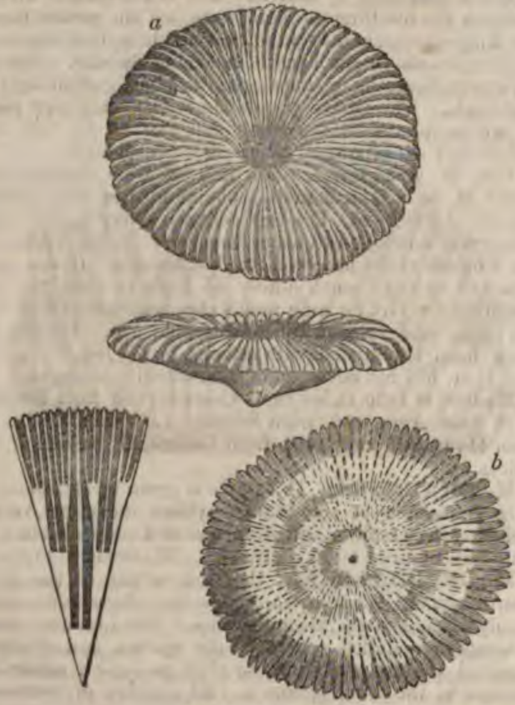
Montlivaltia (fossil).

Animal unknown; solidified by a calcareous *polyparium* of subconical or pyriform figure (fixed); transversely wrinkled below; enlarged, excavated, and lamellato-radiate above. From the oolite of Caen. Goldfuss refers it to Anthophyllum of Schweigger; and Blainville says it is closely allied to Cyclolites.

Example. Montlivaltia caryophyllata. Lamx., 'Zooph.' t. 79, figs. 8-10.

Fungia.

Animal gelatinous or membranous, generally simple, depressed, orbicular or oval; mouth superior, transverse in a large disk, which is covered by many thick cirriform tentacula; the disk is solidified internally by a calcareous solid *polyparium*, of a simple figure (seldom complex), ornamented above by a star of radiating aculeated lamellæ, and below by simple rugose rays.



Fungia patellaris.

a, upper face; *b*, lower face.

There are about nine recent (mostly from Indian Seas), and as many fossil species. Blainville arranges them in three groups: simple and circular; simple and compressed; complex and oblong.

The animal, according to Quoi and Gaimard, is very like that of Caryophyllia: it covers the upper face, and returns over the lower, so that the whole polyparium is internal. M. Stutchbury has described the growth of this coral in the 'Linnæan Transactions.'

Example. Fungia patellaris. Ellis and Soland., t. 28, figs. 1-4.

Polyphyllia.

Animals numerous, confluent, with a rather prominent mouth, lobed at the margin; numerous tentacula, not round the mouth, but scattered on the surface of a fleshy part, which entirely envelopes and encloses a calcareous solid *polyparium*. *Polyparium* a free, oval, elongated plate; above rather convex, and covered with lamellar ridges, which are denticulated, prominent, very slender, and transverse, but without stelliform disposition; below rather concave, and roughened by close-set tubercles.

The whole mass is free on the sea-bed.

Example. Fungia talpa of Lamarck. 'Actinologie,' pl. 52, fig. 1.

Anthophyllum.

Animal unknown, containing a calcareous *polyparium* of a conical or pyriform figure, fixed in the lower part, enlarged, flattened, excavated, and multilamellous in the upper part. This genus includes fossil species from antient rocks, and appears imperfectly distinguished from Turbinolia, unless the species of that genus were all free, which is at least doubtful.

Example. Anthophyllum Guettardi, Defr.

Note. Ehrenberg unites in one genus, Monomyces, the Anthophylla Montlivaltiæ, and the two first groups of Fungia.

Turbinolia.

Animal simple, conical, ribbed externally with larger and smaller ribs; terminated above by a mouth begirt with numerous tentacula, and solidified by a calcareous *polyparium.*

Polyparium free, conical, furrowed externally, attenuated to one extremity, enlarged at the other, and ending in a large shallow radiated cell.

Most of the species are fossil: they occur in rocks of all ages, particular species belonging to each; but if the genus is not very obscurely characterised, the use of the term is not very accurate. According to Blainville, the recent T. amicorum has twenty-four ribs; but this number is exceeded vastly in some of the fossil species referred to the genus; and in others there are fewer than twenty-four.

Diploctenium of Goldfuss is a compressed turbinolia, according to Blainville.

Example. Turbinolia amicorum, Bl. South Seas.

Turbinolopsis (fossil).

Animal unknown, solidified by a calcareous *polyparium*, of a simple turbinated figure, and free. This polyparium is lacunose, furnished above with radiating lamellæ, united at short equal intervals, and marked externally by longitudinal flexuous striæ, inclosing between their united edges vertical lines of pores or cells.

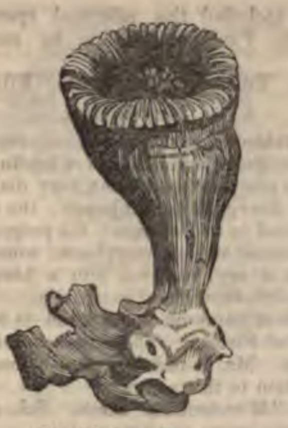
M. Lamouroux describes this genus. It has been recently adopted by Mr. Lonsdale for specimens which occur plentifully in strata below old red-sandstone. ('Silurian System,' by Murchison.) De Blainville appears to think it should be reunited with Turbinolia, but he had not examined the specimens noticed by Lamouroux.

Example. Turbinolia ochracea, Lamouroux. 'Gen. des Polyp.,' t. 82.

Caryophyllia.

Animals actiniform, subcylindrical, provided with a simple or double crown of short, thick, perforated tentacula, which project from the surface of stars or cylindriconical cells: cells furnished with radiating lamellæ internally complete, externally striated, and aggregated into a solid conical polyparium, fixed at the base. The species are grouped according to the simple or fasciculated character of the mass. There are both recent and fossil examples of each group.

Lamarck is the author of this genus, distinguishing it from Turbinolia and from Oculina: he has been followed by nearly all zoologists; but Goldfuss has reunited Caryophyllia and Oculina into his genus Lithodendron.



Caryophyllia cyathus.

ımple. Caryophyllia cyathus. Ellis and Sol., t. 28,

enberg divides this genus, and forms the following
nes:—

Desmophyllum.	*Example*,	C. dianthus.
Cyathina.	"	C. cyathus.
Cladocera.	"	C. calycularis.

Sarcinula.

mals unknown, contained in cells at the end of long
rical tubes; cells lamelliferous, stelliform; tubes
d externally, parallel to the axis, united, by a cellular
erse mass, into a solid calcareous *polyparium*, whose
and under surfaces are plane and parallel.

s genus, established by Lamarck, includes both recent
ssil species. It seems to bear the same relation to
phyllia that certain tubular astrææ bear to the ordi-
orms of that genus. There is no sufficient reason for
njecture of De Blainville, that 'Lithostrotion' of
should be referred to this genus; it has more re-
ance to the following group, with which indeed
ainville has joined it.

Columnaria (fossil).

mals unknown, contained in shallow, multi-radiate,
rm *cells*, at the ends of prismatic tubes; tubes ag-
ed, contiguous, more or less parallel, forming by their
a solid, thick, calcareous *polyparium*.

s is a genus of Goldfuss; established on fossils of the
sition' strata.

Stylina (fossil).

mals entirely unknown, contained in radiated cells at
d of long cylindrical vertical tubes; tubes furnished
ally with distinct lamellæ, which radiate from a solid
r less prominent axis, and are united by a cellular mass
o form a stony *polyparium*, more or less extended,
and echinated above.

enus of Lamarck (originally named *Fascicularia* by
which includes perhaps only one species. The pro-
t axis occurs however in several madreporic fossils not
y referred to this genus—as certain *Cyathophylla* of
ıss. Sarcinula conoidea of this author is ranked by
ille as a Stylina.

Catenipora (fossil).

mals unknown, contained in tubular cells; cells ter-
often oval, *furnished with radiating plates*, and
laterally into a calcareous *polyparium*, which may
cribed as of a conical figure, fixed, composed of ver-
nastomosed lamellæ.

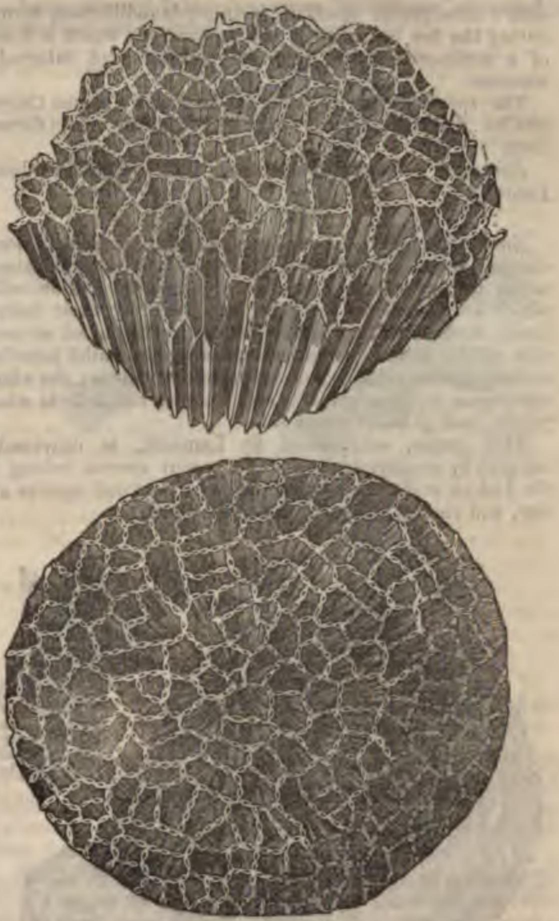
ipora catenulata of old writers is the type of this La-
ian genus, which, with some surprise, we found to
Blainville states, really a lamelliferous coral. He
this inference from examining a fine specimen, at
of Catenipora escharoides, which he considers the only
s. It is peculiar to the 'Transition' rocks, though not,
ps, to the 'Silurian system.'

ımple. Catenipora escharoides, Lamarck. Goldfuss,

cher's genus Halysites is identical with Catenipora.

Syringopora (fossil).

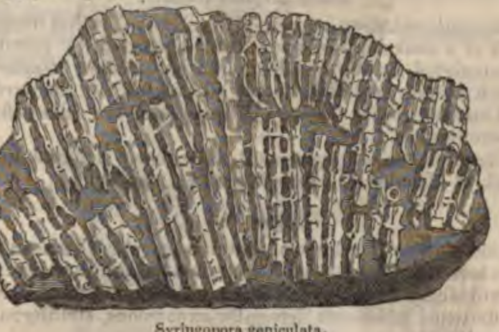
imals unknown, contained in long, subflexuous, tubu-
ertical cells; opening of the cells round, terminal;
rous small horizontal tubuli branch off from the cells,



Catenipora escharoides.

and unite, by anastomosis, the whole ramified mass into one *polyparium*.

Goldfuss is the author of this genus, the species of which were, by older writers, always ranked as Tubiporæ. In our own examinations of Syringopora from the carboniferous limestone (S. ramulosa? Goldfuss), we have had reason to think the interior of the tubes had formerly been radiated, but the traces of the lamellæ are never clear, or even certain. The species belong to Silurian and carboniferous rocks chiefly, perhaps not exclusively.



Syringopora geniculata.

Examples. Syringopora verticillata. Goldfuss, t. 25, f. 6. S. geniculata. Phillips, 'Geol. of York.,' ii., t. 2, f. 1.

Dendrophyllia.

Animals actiniform, furnished with a great number of bifid tentacula, in the midst of which is a polygonal mouth: the cells containing the animals are rather deep, and radiated by numerous prominent lamellæ; the *polyparium* which these compose is widely attached, arborescent, striated externally, lacunose internally, and truncate at the extremities. The species are both recent and fossil.

Example. Dendrophyllia ramea. Sol. and Ellis, t. 38.

Lobophyllia.

Animals actiniform, furnished with many cylindrical tentacula; cells conical (sometimes elongated or sinuous), with a subcipcular opening, laciniato-lamelliferous, terminating the few branches of the *polyparium*, which is fixed, of a turbinated shape, externally striated, and internally lacunose.

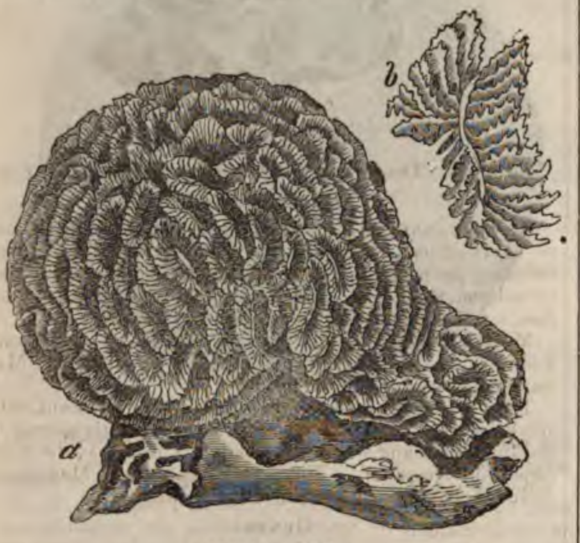
The species were included in Lamarck's genus Caryophyllia: the fossil species are chiefly from the oolitic formations.

Example. Lobophyllia carduus. (Caryophyllia carduus, Lamck.)

Meandrina.

Animals more or less confluent, in one surface, in long sinuous series, having each a distinct mouth and lateral series of very short tentacula, contained in shallow *cells*, which are not really separate, but form by their lateral union sinuous valleys; these valleys are furnished on each side of the mesial line with transverse subparallel lamellæ, ending against ridges which separate the valleys; the whole calcareous *polyparium* is fixed, simple, turbiniform when young, and globular when old.

This genus, established by Lamarck, is universally adopted by zoophytologists. The recent species belong to the Indian or South Atlantic Seas. The fossil species are few, and chiefly belong to the oolitic formation.



Meandrina dædalæa.
a, entire figure reduced; *b*, portion, nat. size.

Example. Meandrina dædalæa. Ellis and Sol., t. 46, f. 1.

Dictyophyllia (fossil).

Animals unknown, contained in polygonal, rather irregular *cells* of a considerable size; cells separated by partitions denticulated on both sides; the calcareous *polyparium* which results is fixed, deeply reticulated on the surface, and encrusts other bodies. (The base of the cells is finely tuberculated.)

The best marked species (D. reticulata) is found in the chalk of Maastricht. Goldfuss, t. 21, *fig.* 3.

Agaricia.

Animals wholly unknown, contained in cells, which often appear incomplete or confused, and sublamellar internally: they constitute by their union a stony *polyparium*, fixed, formed of flattened foliaceous irregular expansions, stelliferous on one side only.

The recent species are not numerous; we receive them from the Indian Ocean and South Sea. Goldfuss refers some fossils to this genus.

Example. Agaricia cucullata. Ellis and Sol., t. 42 f. 1, 2.

Tridacophyllia.

Animals actiniform, confluent, very depressed, enlarged, and attenuated to a finely crenulated edge; mouth central, a little tuberculous, *but without tentacula;* cells deep, irregular, foliaceous in the borders, lamellato-radiate, and denticulate within, externally and irregularly striated; the *polypiferous* mass thus formed is calcareous, foliaceous, not porous, striated, turbinated and fixed at the narrow part.

Lamarck included the principal species (T. lactuca) in his genus Pavonia; another he named Explanaria aspera.

Example. Tridacopnyllia lactuca. Ellis and Sol., t. 54.

Monticularia.

Animals unknown, contained in cells *imperfectly circumscribed*, sometimes even confused or confluent; the lamellæ of these cells are very prominent, very distinct, rather numerous, and diverge from a tubercle; the union of the cells is marginal and in one surface; the *polyparium* is calcareous, very lacunose and polymorphous: sometimes it encrusts other bodies, is agglomerated into a heap, or spreads in sinuous expansions, striated externally.

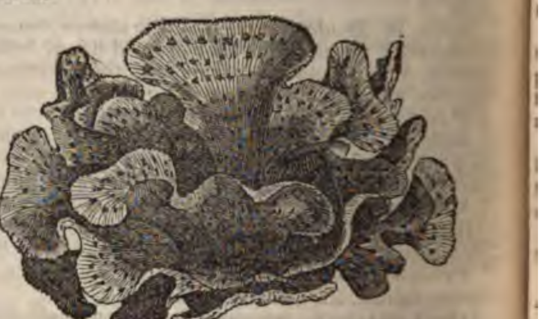
This genus of Lamarck is supposed to be identical with Hydnopora of Fischer. The recent species are from the Indian Seas. Mr. Lonsdale refers a fossil species of the Silurian system to this genus.

Example. Monticularia exesa. Sol. and Ellis, t. 49 f. 3.

Pavonia.

Animals without tentacula; the cells which contained them confluent, conical, small, rather oblique, furnished with many very close lamellæ disposed irregularly, though sometimes in series; the *polyparium* thus composed is solid, fixed, running into various agglomerations and expansions, with sharp edges.

The recent species are from the East and West Indian Seas. The few fossil species are from transition and oolitic formations.



Pavonia boletiformis.

Example. Pavonia boletiformis. Ellis and Sol., t. 32, f. 3, 4.

The following genera, viz.: Astræa, Echinastræa, Oculina, and Branchastræa, are grouped by De Blainville under the subsectional title of MADRASTRÆA :—

Astræa.

Animals short, more or less cylindrical; mouth rounded, placed in the midst of a disk covered with few and rather short tentacula; *cells* shallow, lamellæ radiating, and forming by their union a fixed polymorphous *polyparium*, which often encrusts other bodies, or is agglomerated on itself. This great genus is divided into sections.

Section A. *Astræoides* of Quoi and Gaimard.—Stars *round* and often disjoined.

Example. Astræa calycularis (*Caryophillia calycularis* of Lamarck). Mediterranean.

Section B. *Meandriniform Astrææ.*—Stars distinct, unequal, *oblong*, more or less *diffluent*, forming encrusting or agglomerated masses.

Example. Astræa uva.

Section C. *Gemmastræa.*—Stars *circular*, very *distant*, *prominent*, and forming encrusting masses.

(These are chiefly fossil.)

Example. Astræa Lucasiana, Defr., from the oolite of Besançon.

Section D. *Tubastræa.*—Cells tubular, vertical, more or less distant, with a round opening, the edges being hardly prominent, and radiated by a moderate number (12 to 24) of *complete* lamellæ. This section includes many recent and fossil species.

Example. Astræa faveolata. Ellis and Sol., t. 53.

(The animal is described by Quoi and Gaimard.)

Section E.—Cells roundish, *approximate*, sometimes irregular, rather shallow; the lamellæ very dis-tinct, cutting, complete, *extended over the rounded interstices*; mass encrusting or agglomerated.

Astræa ananas.

Example. Astræa ananas. Ellis and Sol., t. 47.

Section F. *Siderastræa.*—Cells superficial or shallow, indefined, with numerous very fine lamellæ, radiating from an *excavated centre*, and continued to meet or even to join those of neighbouring cells.

Example. Astræa siderea. Ellis and Sol., t. 49.

The fossil species are numerous, especially in the later secondary and tertiary rocks.

Blainville makes several groups of them according to the manner of their growth.

Section G. *Dipsastræa.*—Of a globular figure; cells profound, infundibuliform, subpolygonal, contiguous, with common partitions, which are elevated, *sulcated*, and *echinulated* on the edges.

Example. Astræa dipsacea, Lamarck; Madrepora favosa, Ellis and Sol., t. 50.

There are fossil species in the secondary and tertiary strata.

Section H. *Montastræa.*—In thick masses composed of tubular cells, which acquire a polygonal figure from juxtaposition; their edges not prominent; the cavity not deep, furnished with numerous lamellæ united to a solid prominent axis. The known species are fossil.

Section I. *Favastræa.*—In a thick mass composed of large polygonal excavated cells, pluriradiate, depressed in the centre, and hollowed towards the margin. (*Acervularia* of Schweigger; *Cyathophyllum* of Goldfuss.)

Goldfuss's generic name is much employed for fossils of the Silurian rocks.

Example. Recent, Astræa magnifica. Indian Sea. Fossil, Astræa Baltica, Bl. (A. ananas, Linn.)

(Mr. Lonsdale has proposed a new genus, allied to *Cyathophyllum;* and from its vesicular internal structure calls it *Cystiphyllum.* From Silurian rocks.)

Section K. *Strombastræa.*—In corticiform masses composed of infundibuliform, polygonal, radiato-lamelliferous cells, which are proliferous, or succeed one another vertically. Goldfuss calls the group Strombodes. Its distinctness is doubted by Blainville.

Example. Strombodes pentagonus, Goldfuss. Fossil, in the North American limestone.

Section L. *Cellastræa.*—The species of this group differ from the Dipsastrææ principally by the fineness of their radiating lamellæ, and by a peculiar cellular structure. The fossil species are found in tertiary strata.

Example. Astræa incerta. Sol. and Ellis, t. 47, 3.

In concluding his examination of the great genus Astræa (which includes several other genera adopted by Goldfuss, Schweigger, &c.), De Blainville acknowledges the probable imperfection of the arrangement above given, and notices the transitions which it presents to the generic groups of Caryophyllia, Pavonia, Oculina, &c. Perhaps until the relation of the lamelliferous cells to their contained polypi is known from a very general investigation of recent types, zoologists will do wisely not to propose new genera from ill-understood specimens of antient corals.

Echinastræa.

Animals unknown, contained in raised cells which are strongly radiated, rather irregular, echinulated, and *occupy only the upper surface of the coral.* The mass is either fixed or free, expanded into a lobate or reflexed plate, internally echinated, striated, but not porous externally.

(Part of Explanaria, Lam., is included in this new group, as well as Echinophora of that author.)

Example. E. ringens, Lam.

Oculina.

Animals unknown, contained in regular, round, radiated cells, more or less prominent, and scattered on the surface of a solid, compact, arborescent, fixed polyparium. Lamarck established the genus; Schweigger has united it to Astræa, and Goldfuss to Caryophyllia.)

Oculina axillaris.

Example. Oculina axillaris. Ellis and Sol., t. 13, f. 5.

Branchastræa.

Animals unknown; the cells which contained them are of a cylindrical figure, channelled internally, prominent, radiating from the general mass, and united into a ramose, cylindrical, solid coral. Only one species, *B. limbata*, Goldfuss, t. 8, f. 7; from the Jura limestone, Suabia.

MADREPORÆA, the second section of the Stony Zoantharia of De Blainville, and placed by him after MADREPHYLLIŒA.

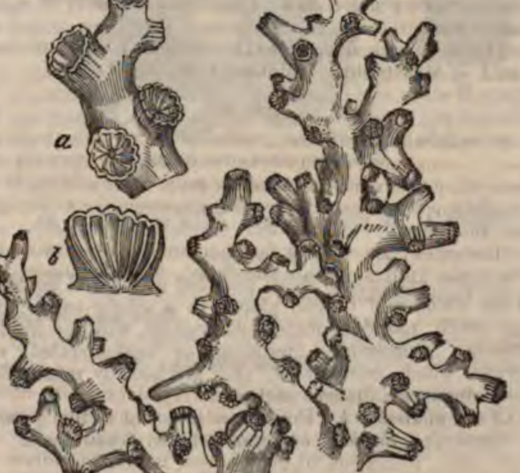
The Corals of this section are generally arborescent, with small partially lamelliferous cells, and constantly porous in the interstices and walls of the cells. This last is the most important character. The Lamarckian genus Madrepora included many of the genera of De Blainville.

GENERA.

Dentipora.

Animals unknown; cells deep, circular, mammillated, furnished with ten dentiform lamellæ prominent towards the margins, scattered in the *polyparium*, which is compact, expanded, its parts anastomosing together, and echinulated with strong interstitial tubercles.

The species are ranked with Oculina by Ehrenberg and earlier authors.



Dentipora virginea.

a, magnified; *b*, section of the lamelliferous cell.

Example. Dentipora virginea. Ellis and Sol., t. 36.

Astræopora.

Animals unknown (probably provided with a single crown of 12 tentacula): the cells which contained them are prominent, mammillary, internally sulcated, and irregularly scattered on the surface of the polyparium. Polyparium extremely porous and echinulated, enlarged into thin expansions.

Example. Astræa myriophthalma of Lamarck.

Sideropora.

Animals unknown; *cells* deep, immersed, circular or subhexagonal, with six deep notches at the border, and a prominent central axis, irregularly dispersed on the arborescent, palmated, finely granulated, but not porous *polyparium.*

(Several of Lamarck's Porites are placed in this group.)

Example. Sideropora digitata. In the Leyden Museum.

Stylopora.

Animals unknown; *cells* with few lobes at the circumference, internally striated, with a pistilliform axis, irregularly aggregated into an arborescent or subpalmated fixed polyparium, whose interstices are porous and echinulated.

(This group of Schweigger is not considered as really generic.)

Coscinopora.

Animals unknown; *cells* infundibuliform, quincuncial, forming the openings of capillary tubes laterally adherent into an attached, polymorphous polyparium.

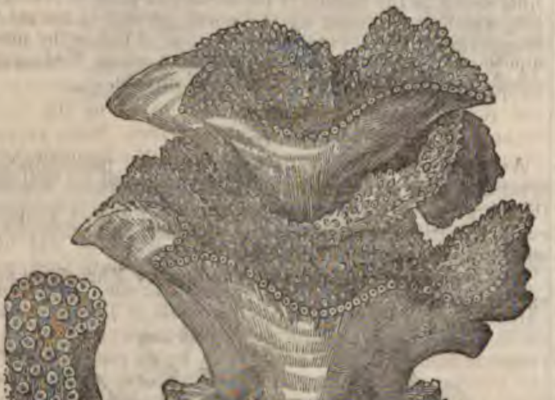
(This group, established by Goldfuss, is ranked by that author near to Retepora. There is apparently no evidence that it should be placed among the Madreporæa.)

Example. Coscinopora infundibuliformis. Goldf., pl. 9, and pl. 30, f. 10.

Gemmipora.

Animals without tentacula: *cells* deep, cylindrical, channelled, and almost lamelliferous within, *prominent in a mammillary form* on the surface of a fixed, porous, arborescent, or laminiform polyparium.

(Several of Lamarck's Explanariæ come into this group.)



Gemmipora mesenterina, diminished.
a, Portion, nat. size.

Example. G. mesenterina. Ellis and Sol., t. 43.

Montipora.

Animals actiniform, short, provided with small tentacula, to the number of twelve, placed in a single series; *cells* very small, rounded, impressed, regular, with few internal grooves. *Polyparium* incrusting or agglomerated, very porous, much echinulated, and marked by mammillary prominences on the free surface.

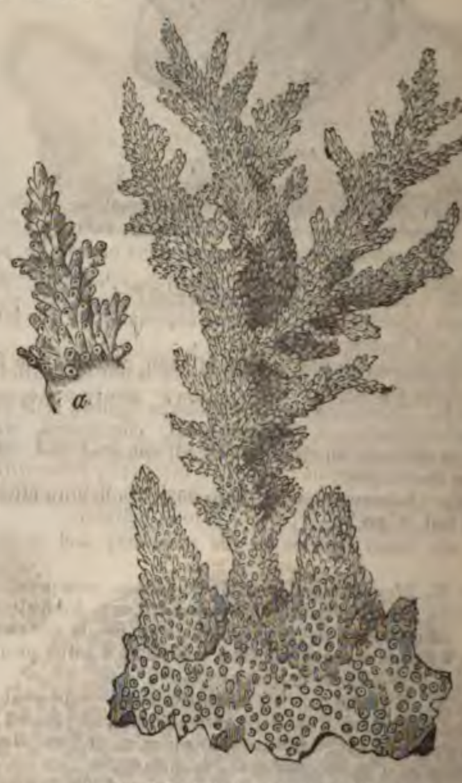
(Some of Lamarck's Porites are included in this genus.)

Example. Porites verrucosa, Lamck. Australasia.

Madrepora.

Animals actiniform, rather short, with twelve simple tentacula; *cells* deep, prominent, scarcely stelliferous, irregularly scattered on the surface, and accumulated towards terminations of the polyparium, which is very por arborescent or frondescent, and fixed.

(This restricted genus includes several recent species, a few fossils.)



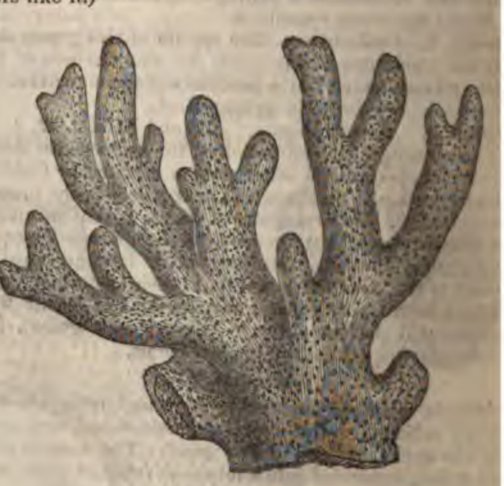
Madrepora abrotanoides, diminished.
a, Termination of one of the branches, nat. size.

Example. Madrepora abrotanoïdes, Lamck. Madrep muricata, Linn. Ellis and Sol., t. 57.

Palmipora.

Animals unknown; *cells* very small, unequal, complet immersed, *obsoletely* radiated, scattered: polyparium fix cellular within, very finely porous and reticulated ext nally, expanded in a palmate or digitated form.

(The genus includes Millepora alcicornis of Linn. others like it.)

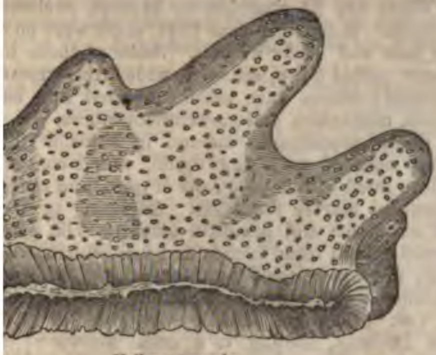


Millepora alcicornis.

Example. Millepora alcicornis, Linn.

Heliopora.

Animals short and cylindrical, with a crown of 15 or broad and short tentacula; cells cylindrical, vertical or su divergent, *immersed, internally crenulated* by partial lam læ; polyparium largely porous in the interval of the cell



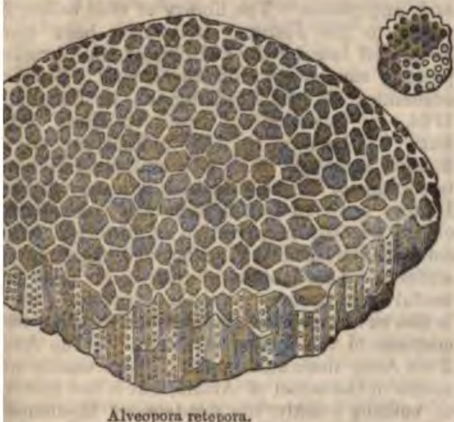
Heliopora cærulea.

. Heliopora cærulea. Madrepora cærulea. Ellis 12, f. 4. Pocillopora cærulea, Lamck. From eas.

pecies in the transition limestone (astræa poro-isually ranked in this genus, is put in Porites by and Lonsdale. (Murchison's 'Silurian Region.')

Alveopora.

actiniform, with twelve simple tentacula; *cells* onal, irregular, unequal, *internally tuberculifer-* rforated or reticulated parietes, echinulated on l edges; polyparium porous, cellular.



Alveopora retepora.

Alveopora retepora. Madrepora retepora, Linn. ol., t. 54, f. 3-5.

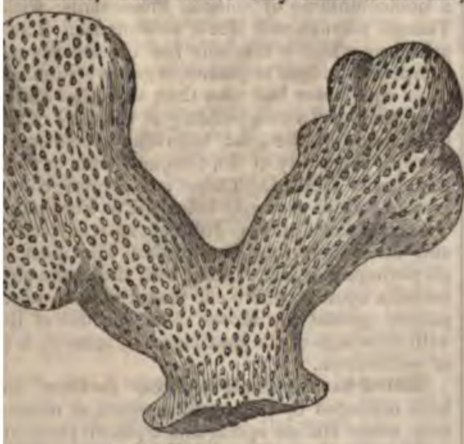
Goniopora.

actiniform, elongated, cylindrical, with a crown n twelve simple tentacula; *cells* polygonal, in-lcated, echinulated on the edges; polyparium orous.

it species (G. pedunculata of Quoi and Gaimard).

Porites

urceolate, with twelve very short tentacula;



Porites clavaria.

al, unequal, imperfectly defined, incompletely filamentous pointed rays, with echinulated olyparium diversiform, porous and echinated.

(A genus of Lamarck, but somewhat contracted by Blainville.)

Example. Porites clavaria, Lamck. Ellis and Sol., t. 47, f. 1.

Seriatopora.

Animals without tentacula?; *cells* immersed, ciliated on the edges, but not internally lamelliferous, ranged in longitudinal series on the cylindrical branches of a porous finely ramified polyparium.

(A genus of Lamarck, modified. It includes only a few species, much like the type, Madrepora *seriata*, Linn.: figured in Ellis and Sol., t. 31, f. 1-2.) Ehrenberg ranks them with Millepores.

Pocillopora.

Animals without tentacula?; *cells* small, shallow, subpolygonal, echinulated on the edges, and sometimes rather lamelliferous within; towards the terminations of the branching polyparium the cells are contiguous and adherent, but separated by granular interstices near the base of attachment. The polyparium is not porous.

(Lamarck established the genus, which is generally adopted. Ehrenberg doubts if there be any tentacula.)

Ex. P. damicornis, Lamck. Recent, in the Indian Sea.

MADREPORITE.—*Anthraconite; Columnar Carbonate of Lime.*—Occurs in roundish masses, the structure of which is columnar and diverging. Fracture indistinctly lamellar. Hardness 3·0; yields easily to the knife. Colour greyish-black. Lustre vitreous. Opaque, or only translucent on the edges. Specific gravity 2·7. It is found in Norway at Stavern, in transition rocks; at Gyphytta in alum slate; in Greenland, and in Salzburg.

Analysis by Klaproth:—

Carbonate of Lime .	93·
Carbonate of Magnesia .	10·30
Carbonate of Iron .	1·25
Silica . . .	4·50
Carbon . . .	0·50
	99·55

MADRID, the capital of New Castile and of Spain, and now also of the province of Madrid, stands on a range of small hills rising in the middle of the extensive plain of New Castile, which is bounded on the north by the mountains of Guadarrama, and on the south by those of Toledo, in 40° 24′ 18″ N. lat., and 3° 42′ W. long. of Greenwich. Madrid is supposed to occupy the site of the Mantua Carpetanorum of the Romans, which was called Majoritum by the Goths, whence its present name Madrid is derived. Some antiquarians contend that it was so called by the Spanish Arabs, in whose language the word *Mageril* meant a 'well-aired house.'

During the occupation of the peninsula by the Arabs the place served as a frontier town, and its castle was often taken from the Arabs and retaken by them until 1086, when it was finally taken by Alphonso VI., the conqueror of Toledo, who annexed it to the bishopric of Toledo, to which it now belongs. It continued to be a mere village until the reign of Henry III. of Castile, who, being passionately fond of hunting the wild boar and the bear, both which animals were then abundant in the mountains near Madrid, made the place his residence during the hunting season. Charles V. occasionally lived in it, and it was at last made the capital of the Spanish dominions by his son Philip II., in opposition to the opinion of his ministers, who strongly advised him to fix his court at Lisbon.

Madrid is more than 2000 English feet above the level of the sea, a circumstance which accounts for the coldness of its winters. In summer the heat is excessive, in some measure owing to the want of trees in the neighbourhood. The thermometer in 1837 rose to 117° of Fahrenheit in the open air. In winter the same thermometer sometimes descends as low as 18°.

Madrid is on the left bank of the Manzanares, a small rivulet which has its rise in the mountains of Guadarrama, about 36 miles from the capital, and which, after flowing under the walls of Madrid, joins the Xarama, a considerable stream, at some distance from the capital. Two majestic bridges, called Puente de Toledo and Puente de Segovia, are thrown over the Manzanares; but such is the contrast between the imposing grandeur of these bridges and the scanty stream which flows beneath them, that it has given rise to the witty saying 'that the kings of Spain ought to sell the bridges, and purchase water with the money.' In winter however the heavy rains, and in spring the sudden melting of the snow on the neighbouring mountains, sometimes swell the Manzanares into an impetuous torrent.

Madrid is surrounded by a brick wall twenty feet high, which contains fifteen gates, mostly built of coarse grey granite. Among these the gate of Alcalá, and that of San Vicente, built in the reign of Charles III., and that of Toledo, erected in the reign of Ferdinand VII., are characterised by purity of design and solidity of structure. During the present civil war, some slight fortifications have been erected on the principal points leading to the city.

The general aspect of Madrid from all the approaches is anything but inviting. The numerous fantastic spires of churches and convents, the tiled roofs of the houses, the sterility of the neighbourhood, and the total absence of good houses, pleasure-gardens, or other buildings which indicate the approach to a great city, give to the capital of Spain the most gloomy and forbidding appearance.

The interior however is not devoid of beauty. The wide and well-paved streets, the extensive and well-planted public promenades in and near the city, with the fountains in many of the squares, the gorgeous churches, and handsome public buildings, remind the traveller that he is in the capital of Philip II. The houses are well constructed: the foundations and some of the ornamental parts are of granite, and the rest of red brick, stuccoed and generally painted. Each house is four or five, and frequently six stories high, and contains, as in Paris, several families. The principal streets, with few exceptions, are moderately wide and handsome: that of Alcalá, for instance, is wider than Portland-place in London, and contains many splendid buildings. The Calle Mayor, Carrera de San Geronimo, Calle de Atocha, &c., would be ornaments to any capital; the rest of the streets are generally narrow and crooked. There are 42 squares, of which the principal are—that of the Royal Palace; that of Santa Catalina, where a beautiful bronze statue of Cervantes has been lately placed; the Puerta del Sol, where the five principal streets of Madrid meet, and which is a place of resort both for the idle and the busy, being the spot where, owing to the proximity of the Exchange, or Bolsa, all commercial transactions are conducted in the open air; the Plaza de la Cevada, where criminals were formerly executed; and lastly, the Plaza Mayor, which is the finest of all. This square is now used as the rallying point for the garrison of Madrid in case of alarm, on account of the strength and solidity of the buildings and the difficulty of approaching it through the narrow crooked streets. Its form is quadrilateral, 434 feet by 334, and it is surrounded with stone buildings six stories high, ornamented with pillars of grey granite, which form a fine piazza all round.

The population of Madrid, as to which no official returns have been published since 1807, was stated by Miñano to be 201,344 in 1826, but this number is generally supposed to be too great for that time, although it may at present be nearly correct. The circumference of Madrid is not above five miles; and there are no suburbs.

The royal palace of Madrid, though unfinished, is one of the finest royal residences in Europe. The interior is decorated in a style of costly magnificence. It stands on the site of the old Alcazar, or palace, inhabited by Philip II., which was burnt to the ground in 1734. Philip V. began the building, which was continued by his successors. It has four fronts, 470 feet in length, and 100 feet high. The custom-house, a noble building, erected by Charles III., to whom Madrid is chiefly indebted for its embellishments; the Casa de Correos (Post-office) in the Puerta del Sol; the palace called de Buena Vista, formerly belonging to the dukes of Alba, now converted into an artillery museum; the royal printing-office in the street of Carretas, and the palace of the duke of Berwick, are among the public and private buildings which adorn the capital. Among the numerous churches and convents which fill the streets of Madrid, scarcely one can be mentioned as a specimen of a pure style of architecture. That of San Isidro, formerly belonging to the Jesuits, has a very fine portal; the convent of the Saleras, founded by Ferdinand VI. and his wife Barbara, is likewise a fine building, and the interior of the church is ornamented with the richest marbles. The convent of San Francisco el Grande, built in 1777, is justly admired for the severity and correctness of the design, its beautiful proportions, and a dome built in imitation of that of Saint Peter's at Rome.

There are 67 churches in Madrid, exclusive of private chapels. Before the year 1834 there were 66 convents, 34 for men and 32 for women. Some of them have been recently pulled down, either to widen the streets or to form squares; others have been converted into barracks, hospitals, magazines, and government offices.

Public promenades abound in Madrid. That which is most resorted to is the Prado, which consists of various alleys lined with double rows of trees, and ornamented with beautiful marble fountains. Adjoining to it is the Retiro, an extensive and beautiful garden. The garden suffered greatly, both from friends and foes, during the Peninsular war, but was restored by the late king, who added to it an extensive menagerie. Another favourite promenade is a vast plantation outside the gate of Atocha, called las Delicias, leading to a canal known by the name of Canal de Manzanares. This canal, which extends only six miles from Madrid, was intended to unite the capital with the river Tajo at Toledo, by means of the Xarama.

The literary and scientific establishments are generally of old date and insufficient to meet the wants of the present day. Miñano mentions 166 primary schools as existing in 1826, besides two colleges, both conducted by ecclesiastics. This number however has recently diminished. There are two extensive libraries open to the public; one founded by Philip V. in 1712, which contains 150,000 volumes, besides a very large collection of manuscripts, chiefly Greek, which have been described by J. Iriarte, and a museum of medals and antiquities. The library of San Isidro, belonged formerly to the Jesuits. Both have been considerably increased of late by the addition of the libraries of the suppressed convents within the capital. There are also four academies: 1, 'La Academia de la Lengua,' founded in 1724, in imitation of the Académie Française, confines its labours to the publication of works in the Spanish language, such as grammars and dictionaries, and to editions of the best Spanish writers. 2, the Academy of History originated in a society of individuals whose first object was the preservation of historical records. It was confirmed by Philip V., who, in 1738, granted the present statutes. The labours of this body have been far more useful than those of its sister institution: and the nine volumes in quarto already published by them form a valuable addition to the history of Spain. 3, the Academy of the Fine Arts, instituted in 1738, holds weekly meetings at its rooms in the street of Alcalá, but it has hitherto done little or nothing: lastly, the Academy of Medicine. A fine botanical garden, well stocked with exotic plants, forms a delightful spot in the spring, when it is much frequented: attached to the establishment are various professors, who lecture upon botany, agriculture, and geology. The Museum of Natural History in the Calle de Alcalá is not worthy of the praise bestowed upon it by travellers: it certainly contains a splendid collection of minerals from the Spanish dominions in America, but they are badly arranged, and worse kept. It contains however the interesting skeleton of the Megatherium described by Cuvier.

Along the east side of the Prado is the National Gallery, a noble building of colossal dimensions, with a beautiful Tuscan portico and Doric colonnades. The collection of paintings which it contains has been lately pronounced by competent judges to possess a greater number of good pictures with fewer bad ones than any other gallery in Europe. The Armoury, a fine building of the time of Philip II., contains some of the most beautiful specimens of armour in Europe, especially of the *Cinque Cento*, or the fine times of Benvenuto Cellini. There are several complete suits of armour, which formerly belonged to Ferdinand V., Charles V., the Great Captain, John of Austria, Garcia de Paredes, and other illustrious Spaniards. The most interesting of all perhaps is a coat of mail with the name and the arms of Isabella upon it, which she is said to have worn in her campaigns against the Moors. An account of this collection, with drawings of the best pieces of armour, is now in course of publication.

Madrid has two small theatres, 'La Cruz' and 'Principe,' both managed by the Ayuntamiento, or municipal corporation, where Italian operas and Spanish plays are alternately acted. Another, of much larger dimensions, called the 'Teatro de Oriente,' has been lately built in the centre of the square, opposite to the royal palace, but is still unfinished for want of funds.

The inhabitants of Madrid repair, every Monday during the season, to a vast amphitheatre outside of the gate of Alcalá, where the favourite spectacle of bull-fights is exhibited.

The police of Madrid is not good. The streets are generally dirty, and the approaches to the city sometimes blocked up by heaps of rubbish. The city has no common sewers. Notwithstanding the great number of fountains, the want of good water is severely felt in summer. The city itself is considered to be extremely unhealthy; and if Philip II. chose it for his residence on account of the purity of the air and the quality of its waters, as we are told, Madrid must have undergone a complete change since that time. The sharp winds which blow from the Guadarrama mountains in winter produce the endemic pulmonia or pneumonia, which often proves fatal in a few hours. A sort of colic, caused by the dryness of the atmosphere, is likewise a prevalent complaint in summer.

Charitable and benevolent institutions are numerous, and some are amply provided with funds; but the management having always been in the hands of the clergy, the funds have been spent in building monasteries and churches, rather than applied to the charitable purposes intended by the donors. An institution, supported by voluntary contributions and patronised by the government, has recently been established outside of the city, for the reception of beggars, who were formerly objects of horror and disgust in the streets of Madrid.

On the 23rd of March, 1808, Madrid was entered by the French troops under Murat, and the royal family was decoyed into France. The heroic rising of the inhabitants of Madrid on the 2nd of May of the same year obliged the French to evacuate the town, and aroused the whole Spanish nation. Madrid was again occupied by Napoleon in person in December following, and by his brother Joseph in 1809.

Madrid has little manufacturing industry. A manufacture of porcelain and another of tapestry are both the property of the crown.

(Laborde's *View of Spain*, vol. iii.; *Viage Artistico de España*, vol. vi.; Miñano, *Diccionario Geografico de España y Portugal*, vol. v.; Quintana, *Grandeza de Madrid;* Capt. Cook's *Sketches in Spain;* and chiefly, Mesonero, *Manual de Madrid.*)

MADRIGAL, in music, an unaccompanied vocal composition, sometimes in three parts, but commonly in more; and as the true madrigal is written in what is termed the learned style—abounding in points of the fugal or imitation kind—it is, almost necessarily, as much the produce of study as of genius. Morley—himself a renowned writer of madrigals—says that in this sort of composition 'no point is to be long stayed upon, but once or twice driven through all the parts, and sometimes reverted [inverted], and so to the close, then taking another. And that kind of handling points is most esteemed when two parts go one way, and two another way, and most commonly in tenths or thirds. Likewise the more variety of points be showed, the more is the madrigal esteemed: and withal you must bring in fine bindings (sincopations) and strange closes, according as your ditty shall move you. Also in compositions of six parts (or five) you must have an especial care of causing your parts to give place one to another, which you cannot do without resting; nor can you cause them to rest till they have expressed that part of the dittying which they have begun.' (*Treatise*, 1597.)

The madrigal is to be traced to a very early period in the history of vocal music in parts: to the Flemings we are indebted for its birth, about the middle of the sixteenth century, and the Italians took it up shortly after, with what success the names of Palestrina, Marenzio, Conversi, Ferretti, &c., will bear witness. Nor were the English deficient in emulation or slow in manifesting it; Morley's first book of madrigals was published in 1594, Weelkes's in 1597, Wilbye's in 1598, Bennet's in 1599, and only a few years later, John Ward's and Orlando Gibbons's appeared. Dowland's and Ford's lovely compositions, the former published in 1597, and the later in 1607, have the title of madrigal bestowed on them, but they are more properly part-songs, or what would now be called glees. And here it may not be improper to say, that we are among the many who are of opinion that the English madrigalists have no superiors. To which we will add, that for the preservation of this high order of composition, the art has long been, and still continues to be, indebted to the *Madrigal Society*, a club, consisting chiefly of amateurs, founded in London in 1741, and which, by zeal and perseverance, has succeeded in diffusing throughout the British Isles a taste for a species of music as delightful as it is scientific, and exactly suited to the choral societies already existing, or springing up, in all our great manufacturing and commercial towns.

Every attempt to fix, with any precision, the derivation of this word, has been baffled. Menage thinks that *Mandra*, 'a sheep-fold,' is its source, for he supposes it to have been, in its origin, a pastoral song. Bishop Huet considers it a corruption of *Martegaux*, a name given to the inhabitants of a district of Provence, who, according to a learned French writer, excelled in the species of poetical composition called the *Madrigale*. Dr. Burney agrees with Doni, who derives it from *Alla Madre*, the first words of certain short hymns addressed to the Virgin. And Sir John Hawkins remarks, that there is a town in Spain named Madrigal. But all these conjectures—for they amount to no more—are merely plausible, and we only offer them in the absence of a more satisfactory etymology.

MADURA, an island in the Eastern seas, separated by a narrow strait from the north-east coast of Java. This strait is sufficiently deep to allow the largest ships to pass through, but the guidance of a pilot well acquainted with the navigation is required for that purpose. Madura lies between 6° 58′ and 7° 30′ S. lat., and between 110° 20′ and 111° 50′ E. long. Its extreme length from east to west is 90 miles, and its mean breadth 17 miles. The island is politically divided into three districts, each of which is nominally under the government of a native chief, but the whole are subject to the authority of the Dutch governor of Java. These divisions are:—Bangkalan, occupying the western; Pamakassan, the centre; and Sumanap, the eastern portions of the island. Each division contains a town or capital, bearing the name of the district. In the year 1746 the Dutch exercised so much authority over the chiefs or panumbahans of Madura, that they settled the order of succession, and obliged them to pay a tribute, partly in money and partly in the products of the country. For some services rendered to the Dutch government in 1825, during the insurrection in Java, the chief of Sumanap received the title of sultan.

The population of Madura in 1815, according to a census made by the English government, which was then in the possession of the island, was 218,659 souls, of whom 6344 were natives of China. The inhabitants reside in villages, of which there are about 1100 in the island. The character of the natives resembles very nearly that of their Javanese neighbours; but they are more warlike, and are more readily disciplined as soldiers: they speak a peculiar dialect, which has but little resemblance to that in use in Java. The religion of the Madurese is Brahminical, and the practice of widows burning themselves with the bodies of their husbands is prevalent.

The soil of Madura is fertile, and produces abundance of fine rice, part of which is exported to Java, Buffaloes and sheep are also bred for exportation, and a considerable quantity of coco-nut oil is also prepared for the same purpose; but the principal export-trade of the island consists of salt, many cargoes of which are taken every year to Java, Sumatra, and Borneo. (Stavorinus's *Voyages;* Crawfurd's *Indian Archipelago.*)

MÆANDER. [Anatolia.]

MÆCE'NAS, CAIUS CI'LNIUS, belonged to the equestrian order (Horat., *Carm.* i. 20, 5; Velleius Paterc., ii. 88; Tac., *Ann.* vi. 11), and was descended from an antient Etruscan family (Horat., *Carm.* i. 1, 1; iii. 29, 1; *Serm.* i. 6, 1) at Arretium. (Liv., x. 3.) The cognomen Mæcenas is derived, according to Varro, from a town of the same name. (*De Ling. Lat.*, vii., *end.*) We are ignorant of the place and time of his birth; but he appears to have received a superior education, and was well acquainted with the Greek language. (Hor., *Carm.* iii. 8, 5; *Epist.* i. 19, 1.) He early became acquainted with Octavianus (Augustus Cæsar), and continued through his life an intimate friend and chief adviser of that emperor. While Augustus was engaged in opposing Sextus Pompeius, and also during many of his other wars, Mæcenas was entrusted with the charge of the city; and it appears to have been owing in a great degree to his prudence and sagacity that peace was preserved in Rome during the absence of Augustus. (Tac., *Ann.*, vi. 11; Dio., xlix. 16; Seneca, *Epist.* 114; Hor., *Carm.* iii. 29, 25; and Lepidi.) Mæcenas is said to have dissuaded

Augustus from his purpose of restoring the antient Roman constitution, which Augustus however could never have seriously intended. (Sueton., *Octav.*, 28; Seneca, *De Brev. Vit.*, 5.) Mæcenas was held in the greatest honour by Augustus, although during the latter part of his life he appears to have been for a short time in disgrace with the emperor, principally owing to the intrigues of his wife Terentia (Tac., *Ann.*, iii. 30; Dio., liv. 19, lv. 7); but he was probably received into favour again before his death, which happened B.C. 8, four years after that of Agrippa. Mæcenas enjoyed with Agrippa the full confidence of Augustus, and his death was considered by Augustus as an irreparable loss. (Seneca, *De Benefi.*, vi. 32.) If we may believe a tale related by Dion, he sometimes rebuked the emperor with the utmost freedom (lv. 7).

Mæcenas was a great patron of literature; and it was principally owing to his assistance and support that Virgil and Horace were raised from a state of poverty and indigence, and enabled to devote themselves to poetry. They were both admitted to his friendship, and Horace in particular appears to have lived on terms of the greatest intimacy with him.

The health of Mæcenas was not good (Pliny, *H. N.*, vii. 52), and was probably injured by his luxurious and voluptuous habits. (Sen., *Epist.* 120; Juv., xii. 39; Petron., 81; Dio., liv. 30; Tac., *Ann.*, i. 54; Plutarch, *Erotica*, c. 16.) He lived in a magnificent house on the Esquiline Hill, from which Nero is said to have witnessed the burning of Rome. (Suet., *Nero*, c. 38; Sen., *Epist.* 114.)

Mæcenas wrote several works, none of which have come down to us. Their loss however is not much to be deplored, since, according to the testimony of many antient writers, they were written in a very artificial and affected manner. (Suet., *Octav.*, c. 86; Sen., *Epist.* 114; Tac., *Dial. de Orat.*, c. 26, who speaks of the *calamistros Mæcenatis.*) They consisted of poems, tragedies (one entitled 'Prometheus,' and another 'Octavia'), a history of the wars of Augustus (Hor., *Carm.* ii. 12, 9), and a symposium, in which Virgil and Horace were introduced. (Servius on Virg. *Æn.*, viii. 310.) The few fragments which remain of these works have been collected and published by Lion under the title of 'Mæcenatiana, sive de C. Cilnii Mæcenatis Vita et Moribus,' Göttingen, 1824.

There is a curious passage in the 'Saturnalia' of Macrobius (ii. 4), in which he gives an extract of a letter from Augustus to Mæcenas, in which the emperor ridicules the style of his friend: 'Vale, mel gentium, melcule, ebur ex Etrutria, lafer (lacer?) Aretinum, adamas supernas, Tiberinum margaritum, Cilniorum smaragde, jaspis figulorum, berylle Porsenæ, carbunculum habeas, *ἵνα συντέμω πάντα μάλαγμα* (*ἵνα συντείνω πάντα μαλάγματα*?) mœcharum.'

MAELSTROM. [TRONDHEIM.]

MÆNU'RA, or MENU'RA, Dr. Shaw's and Dr. Latham's name for a singular genus of birds, whose place in the system has occasioned some difference of opinion among ornithologists.

In 'An Account of the English Colony of New South Wales, from its first settlement in January, 1788, to August, 1801, &c. &c., to which are added some particulars of New Zealand, compiled by permission from the MSS. of Lieut.-Governor King; and an Account of a Voyage by Captain Flinders and Mr. Bass, &c. &c., abstracted from the Journal of Mr. Bass, by Lieut. Collins of the Royal Marines,' &c. (4to. 2 vols., 1802, London), it appears that in January, 1798, in consequence of the determination of certain Irishmen to go out for the discovery of a settlement for themselves, the governor, after ineffectually trying corporal punishment, determined, with a view of checking the spirit of emigration, to convince these Irish by their own experience of the danger and difficulties which attended it, and accordingly he caused four of the strongest and hardiest among them to be chosen by themselves, and properly prepared for a journey of discovery. They were to be accompanied by three men, upon whom the governor knew he could depend, and who were to lead them back when fatigued and exhausted with their journey over the worst and most dangerous part of the country. A conspiracy to murder the guides was discovered, and counteracted by the addition of four soldiers to the guides, and on the 14th they set off from Paramatta. On the 24th the soldiers returned with three of the deputies, who, having gained the foot of the first mountains, were so completely sick of the journey, and of the prospect before them, that they requested to return with the soldiers, whose mission here terminated. The three persons who had been sent out with the Irishmen returned on the 9th of February. 'On arranging their courses and distances on paper, they appeared to have travelled in a direction south-west three-fourths west about 140 miles from Paramatta. They brought in with them one of the birds which they had named pheasants, but which, on examination, appeared to be a variety of the Bird of Paradise. The size of this curious and handsome bird was that of a common hen; the colour a reddish-black, the bill long, the legs black and very strong. The tail, about two feet in length, was formed of several feathers, two of which were the principal, having the interior sides scalloped alternately of a deeper or lighter reddish-brown inclining to orange, shading gently into a white or silver colour next the stem, crossing each other, and at the very extremity terminating in a broad black round finishing. The difference of colour in the scallops did not proceed from any precise change in the colour itself, but from the texture of the feather, which was alternately thicker and thinner. The fibres of the outer side of the stem were narrow, and of a lead colour. Two other feathers of equal length, and of a blueish or lead colour, lay within those; very narrow, and having fibres only on one side of the stem. Many other feathers of the same length lay within those again, which were of a pale greyish colour, and of the most delicate texture, resembling more the skeleton of a feather than a perfect one.' Lieut. Collins then gives a figure of the bird 'from the pencil of a capital artist,' which seems to have been handed down from author to author, and is indeed upon the whole correct, with the name of *Mænura superba.*

M. Temminck arranged the form under his order of Insectivorous Birds (*Insectivores*), among the Thrushes, giving it a position between *Cinclus* and *Pitta.*

Cuvier does not differ much in his views from M. Temminck; for he places it among his great group of *Passereaux* (Cuvier's 2nd order), and it stands in the 'Règne Animal' in the following relative position: '*Oriolus, Gymnops, Mænura, Motacilla.*'

M. Vieillot differs almost entirely from both Temminck and Cuvier; for, though he includes it in his second order, which corresponds with the *Insessores* of Mr. Vigors, the *Lyriferi* stand in M. Vieillot's 'Analyse' at the extremity of that order, and near the groups of *Columba* and *Penelope.*

Illiger, in his *Prodromus*, arranged it among the *Rasores.*

Before we proceed to a consideration of the views of more modern authors, it is right to put the reader in possession of Cuvier's description, with his reasons for classing *Mænura* as he did. He says that the size of the bird (a little less than that of a common pheasant) has caused it to be referred to the Gallinaceous Birds, but that it belongs evidently to the Passerine order from its feet, whose toes (excepting the first articulation of the external and middle toe) are separated, while the form approaches the Thrushes (*Merles*) in the structure of the bill, which is triangular at its base, elongated, and a little compressed, and notched towards its point; the membranous nostrils are large and partially covered with feathers as in the Jays. *Mænura*, he adds, is to be distinguished by the great tail of the male, which is very remarkable for the three sorts of feathers that compose it. The twelve ordinary feathers are very long, with loose and very distant barbs; two more in the middle are furnished on one side only with close-set barbs, and two external ones are curved in the form of an S, or like the branches of a lyre, whose internal barbs, which are large and close-set, represent a broad ribbon, while the external ones are very short and do not become enlarged till towards the end of the feathers. The female has only twelve feathers of the ordinary structure.

Mr. Vigors (*Linn. Trans.*, vol. xiv.), who alludes to the position assigned to the bird by the authors above mentioned, places it at the extreme of his third order (*Rasores*), among his family of *Cracidæ*, for reasons which the reader will find stated in a former volume. [CRACIDÆ, vol. viii., p. 128.]

M. Lesson speaks of the position of the *Mænura* as far from being fixed, and though he follows Cuvier in placing it among the *Passereaux*, he observes that some authors think that it would stand better at the side of *Megapodius*, in the Gallinaceous order. After quoting the words of Cuvier given above, he says, 'The Mænura has then been arranged sometimes among the gallinaceous birds under the ame of the *Lyre-Pheasant* or *Pheasant of the Woods*, and ometimes at the end of the *Calaos* [HORNBILL, vol. xii.] nd the *Hoazins* [CRACIDÆ, vol. viii., p. 132], as M. Vieillot lassed it, while, scientifically speaking, it is near the *hrushes* that *Mænura* ought to take its place, though it eparts distinctly from them in the form of the body.'

Mr. Swainson ('Classification of Birds,' vol. ii., 1837) lludes to the place assigned to *Mænura* and *Megapodius* by Mr. Vigors, and says that they certainly accord more with that family than with any other group of the Gallinaceæ. Mr. Swainson observes that both these genera have the feet uncommonly large, and that both seem to represent the scansorial genus *Orthonyx*, a bird indeed scarcely larger than a sparrow, but agreeing in the very remarkable scansorial character of having the three fore toes of nearly the same size. 'If,' continues Mr. Swainson, 'the *Cracidæ*, as we believe, is the scansorial family of the *Rasores*, this singular analogy is precisely what we should expect in two groups representing the same tribes.' In the synopsis at the end of the volume Mr. Swainson cancels the term *Cracidæ*, and substitutes in its place the family *Megapodinæ* (Megapodidæ?), remarking, that as he has every reason to believe, from an attentive study of this family, that *Crax* is an aberrant genus, he has thought it better to correct his former error, and to name the whole from that group which is one of the chief types; and he makes *Mænura* the first genus of his 'Family *Megapodinæ*, *Greatfoots*,' with the following

Generic Character.—*Bill* moderate, depressed at the base, straight; the tip obsoletely notched. *Nostrils* naked and placed near the middle of the bill. *Feet* very large, strong and robust; nearly all the anterior toes equal; the claws enormous for the size of the bird, obtuse, and slightly curved. *Wings* short. *Tail* very long, lyre-shaped; the feathers singularly developed. The typical or conirostral form of the whole family.

Example, *Mænura superba*, *Mænura Lyra* or *Lyrata*, *Mænura Novæ Hollandiæ*, Shaw, Lath., *Mænura paradisea*,* Vieill., the only species known.

Description.—Lieutenant Collins, in the work above quoted, gives, towards the end of his second volume, 'a more minute and ornithological description (with which he had been 'favoured') than that stated above. The second description is as follows. 'The bill of this bird, which has been named the *Mænura superba*, is straight, having the nostrils in the centre of the beak. The base of the upper mandible is furnished with hairs like feathers turning down; the upper mandible is at the base, somewhat like that of the pigeon. The eye is a dark hazel, with a bare space around it. The throat and chin are of a dark rufous colour; the rest, with the body, of a dusky grey. The feathers on the rump are longer than those of the body, and more divided. The colour of the wings, which are concave, is dark rufous. The legs and claws are large in proportion to the bird, particularly the claws. The outward toe is connected with the middle one as far as the first joint. The tail is long, and composed of three different sorts of feathers, of which the upper side is of a dark grey, with ferruginous spots. The first two lower feathers, which are a little curved in two directions, are beneath of a pearly colour, enriched with several crescent-shaped spaces, of a rich rufous and black colour. The laminæ are unwebbed, turned round toward the extremity, and ornamented with a black bar, the breadth of an inch, and fringed at the end. The shaft of the second, which is likewise long, is fringed with long hair-like filaments; and the third, which is also long and curved, is plumed on the inner side only, except at the extremity, where there are a few separated filaments of a dark-grey colour.'

'The female *Mænura superba* differs very little from the male, except in the tail, which is composed of twelve feathers, a little curved and plumed, having the upper side dark rufous and grey, and the under of a pearly colour.'

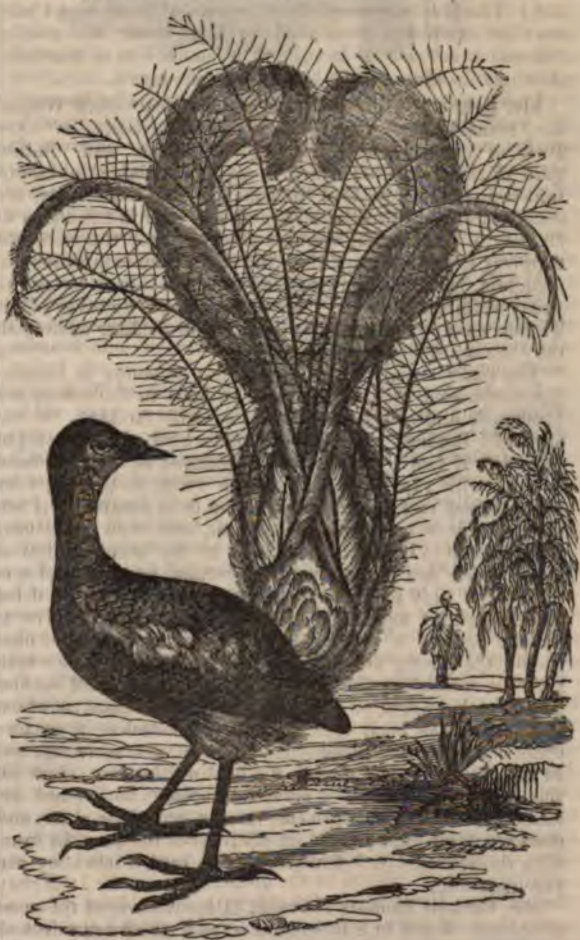
The more modern descriptions of the tail of the female state it to be simply brown, and composed of long uniform feathers, which are straight and graduated.

Notwithstanding the sombre hues of this extraordinary bird, the magnificence and peculiar structure of the beautiful tail of the male, which imitates the form of an antient Grecian lyre, give it a superb appearance.

Locality.—New South Wales, principally in the forests of *Eucalyptus* and *Casaurina* which cover the Blue Mountains, and in their rocky and retired avenues.

Habits.—Lieutenant Collins says that 'the following particulars relating to these birds were observed by persons resident in the country, and who were eye-witnesses of what is here told. They frequent retired and inaccessible parts of the interior; have been seen to run remarkably fast, but their tails are so cumbrous that they cannot fly in a direct line. They sing for two hours in the morning, beginning from the time when they quit the valley, until they attain the summit of the hill, where they scrape together a small hillock with their tail spread over them, imitating successively the note of every bird known in the country. They then return to the valley.' If dependence could be placed upon this account as far as relates to the singing, it would assist the views of those who would place *Mænura* near the Thrushes; among the gallinaceous birds, singing, in the common acceptation of the word as applied to birds, is not known. But this sort of statements, taken as they mostly are from the relation of those who are not very careful as to the truth of their communications, if they can only surprise and please their auditors, must be received with many grains of allowance. The 'song' is not corroborated by subsequent observers.

Mr. Caley informed Mr. Vigors, that from the observations he was enabled to make on these birds during his stay in New Holland, it was his opinion that these birds were gallinaceous. Mr. Caley generally found them in flocks, and for the most part on the ground. M. Lesson states that they come forth in the evening and the morning, remaining quiet during the day on the trees whereon they perch. He says that they are becoming more and more rare, and that he only saw two skins during the whole of his stay at New South Wales. Mr. Swainson informs us that chief-justice Field of Gibraltar, who was long a resident in New Holland, assured him (Mr. S.) that *Mænura* in all its habits was a gallinaceous bird, living on the ground in small societies, and being very fond of rolling in the dust.



Mænura superba, the Lyre-tail (male).

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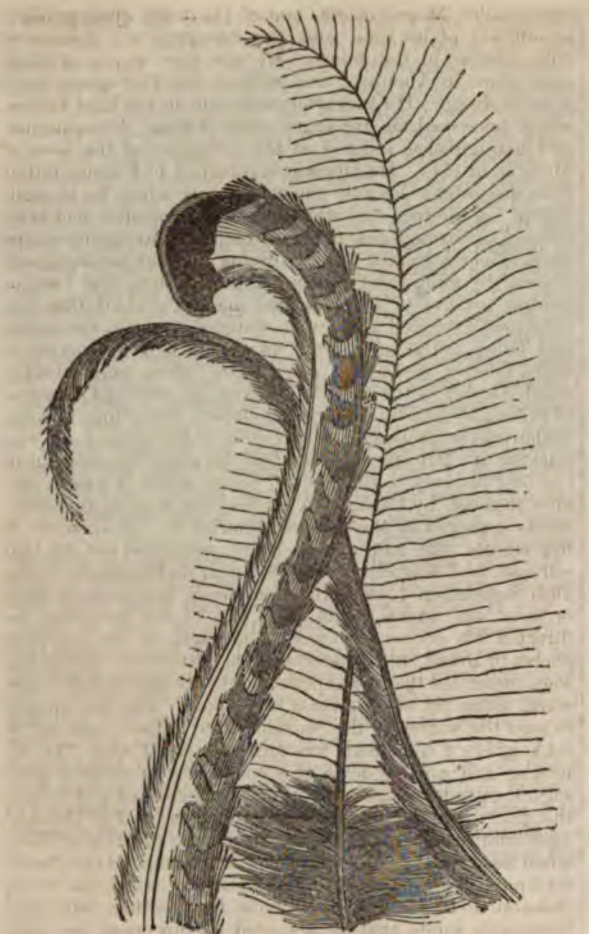
* This is the name adopted by Mr. Swainson.



Some of the tail-feathers of Mænura superba.

Mr. Bennett in his 'Wanderings in New South Wales,' &c., remarks that this 'Native Wood-Pheasant,' or 'Lyre Bird' of the colonists; the 'Béleck-Béleck' and 'Balangara' of the aboriginal tribes, is abundant about the mountain-ranges in all parts of the colony. The tail feathers are detached entire from the bird, and are sold in the shops at Sydney in pairs. Mr. Bennett observes that the price was formerly low; but now that the bird, from continued destruction, has become rare, their tails fetch from twenty to thirty shillings the pair. About the ranges however of the Tumat country, where they have been seldom destroyed, they are more frequently seen.

The same author states that it has its young in December, the season when all the wild animals in the colony are produced, and can be then procured with facility. 'It is,' says Mr. Bennett in continuation, 'a bird of heavy flight but swift of foot. On catching a glimpse of the sportsman it runs with rapidity, aided by the wings in getting over logs of wood, rocks, or any obstruction to its progress; it seldom flies into trees, except to roost, and then rises only from branch to branch: they build in old hollow trunks of trees which are lying upon the ground, or in the holes of rocks; the nest is formed merely of dried grass or dried leaves scraped together; the female lays from twelve to sixteen eggs of a white colour, with a few scattered blue spots; the young are difficult to catch, as they run with rapidity, concealing themselves among the rocks and bushes. The Lyre Pheasant, on descending from high trees, on which it perches, has been seen to fly some distance; it is more often observed during the early hours of the morning, and in the evenings, than during the heat of the day. Like all the gallinaceous tribe, it scratches about the ground and roots of trees, to pick up seeds, insects, &c. The aborigines decorate their greasy locks, in addition to the emu feathers, with the splendid tail feathers of this bird, when they can procure them.'

Mr. Bennett laments the rapid disappearance of the races of animals found in a new country, and which are pursued, whether useful or dangerous, even to extermination. He states that in the settled parts of the colony, the harmless kangaroos and emus are rarely seen, when they might easily be domesticated about the habitations. 'The same remark,' he adds, 'applies to the Lyre Pheasant. Why are they not domesticated, before, by extermination, they are lost to us for ever?'

We trust that this may meet the eye of some spirited individual who will *not* suffer the loss to take place, but bestir himself to import these magnificent birds. That they would live in this country, as well as the Emus and Kangaroos, with ordinary care, there can be little doubt; and they would form a striking addition to our aviaries,—perhaps even to our homesteads.

MÆO'TIS, PALUS. [Azoff, Sea of.]

MÆRA, Dr. Leach's name for a genus of Amphipodous crustaceans.

Example, *Mæra grossimana*, Leach (*Cancer Gammarus grossimanus*, Montagu). 'Linn. Trans.,' ix., tab. 4, fig. 5. Very common on the English coasts, where it is found under stones and rocks at low water.

MAESTLIN, MICHAEL, a German astronomer, born about the year 1542, probably at Tübingen, in Wirtemberg, at the university of which place he held the appointment of professor of mathematics. While resident in Italy he became acquainted with Galilei, whose conversion from the doctrine of Ptolemy to that of Copernicus is partly attributed by some authorities to the arguments adduced by Maestlin in favour of the latter. Upon his return to Germany he became tutor to Kepler, to whom he behaved with marked liberality; for notwithstanding the great benefit which Kepler must have derived from his instruction, he declined accepting any pecuniary remuneration whatever; indeed Kepler does not appear to have been wanting in gratitude towards him, for both in his 'Mysterium Cosmographicum,' and in a letter prefixed to the 'Narrative of Rheticus,' he acknowledges the great encouragement he had invariably received from his tutor; and at a later period, when struggling with disappointment and poverty, he presented him with a handsome silver cup, bearing an appropriate inscription. Maestlin died at Tübingen, in 1590. His published works are: 1, 'De Stellâ nova.' 2, 'Ephemerides, according to the Prutenic Tables by Erasmus Reinold,' 1551. 3, 'Thesis de Eclipsibus.' 4, 'Observatio et Demonstratio Cometæ anni 1577 et 1578,' Tübing., 1578, 4to. 5, 'Consideratio et Observatio Cometæ,' 1580; Heidelb., 1581. 6, 'Alterum Examen Gregoriani Kalendarii,' Tübing., 1586, 4to. 7, 'Epitome Astronomiæ,' Tübing., 1597, 1610, &c.)

(Watt's *Bibliotheca Brit.*; Hutton's *Mathematical Dictionary*, &c.)

MAFFE'I, SCIPIO'NE, Marquis, born at Verona in 1675, of a noble family, was educated in the college of Parma, and showed an early aptitude for poetry and literature in general. When the war of the Spanish succession broke out, he entered as a volunteer the Bavarian service, in which his brother Alessandro Maffei held the rank of general. After passing some time in Germany he left the army for Italy with the view of devoting himself entirely to study. He wrote upon many and various subjects, and he generally wrote well. His principal works are—1, 'La Merope,' a tragedy, the first written in Italian which deserves the name; it was received with great applause, and went through seventy editions in the author's lifetime. 2, 'Verona Illustrata,' which is the principal work of Maffei, and full of antiquarian and historical learning. The first part contains a history of Verona from its foundation to the time of Charlemagne; the second is a literary history of Verona, with biographical notices of the native writers; the third is a stranger's guide to all the remarkable objects in Verona and its neighbourhood; in the fourth the author illustrates the Roman amphitheatre in that city, which is one of the best preserved remains of the kind. The whole work is written in a spirit of sound criticism, and exhibits the various features of the social, political, and intellectual state of that part of Italy during a long course of ages. 3, 'Della Scienza chiamata Cavalleresca libri tré,' dedicated to Pope Clement XI., in which he combats the absurdity of duelling. 4, Three treatises against the belief, then still prevalent, in magic: 'Arte Magica dileguata,' 1749; 'Arte Magica distrutta,' 1750; 'Arte Magica annichilata,' 1754. Maffei was charged by one Tartarotti with being almost an infidel because he did not believe in sorcery. 5, 'Trattato dei Teatri antichi e moderni,' in which he took up the defence of theatrical performers against the denunciations of

Father Concina, a Dominican, who attributed to them all the corruption of the age. Pope Benedict XIV., in a brief dated the 5th of October, 1750, addressed to Maffei, testified his full approbation of this defence, saying that ‘theatres ought not to be suppressed, but that the performances ought to be as much as possible honest and decorous.’

Maffei had a controversy with the Jansenists on account of something which he wrote concerning the bull Unigenitus [JANSENISTS]; and also because he maintained, against two priests of Verona named Ballerini, that it was lawful to receive a moderate interest on a loan of money, ‘Impiego del Danaro.’ The Jansenist party, which was powerful in North Italy, prevailed on the Venetian senate to exile Maffei, who was then seventy years of age. But the senate soon perceived their error, and Maffei was honourably recalled after four months, and re-entered Verona in triumph.

Maffei, in union with Vallisnieri and Zeno, originated the first literary Journal which appeared in Italy, ‘Giornale dei Letterati,’ begun in 1710, and which was continued till 1730. After the discontinuance of that journal he wrote a sort of continuation of it under the name of ‘Osservazioni Letterarie,’ of which he published six volumes.

In 1733 Maffei visited France, where he collected the materials for his work, ‘Galliæ Antiquitates,’ which he afterwards published. He was numbered among the members of the Academy of Inscriptions. From France he visited England, and was well received at the court of George II., especially by the Prince of Wales, who was very fond of Italian literature. He was made a member of the Royal Society, and the university of Oxford, which he also visited, conferred on him the degree of LL.D. He travelled through Holland and Germany, and returned to Italy after an absence of four years.

Maffei died at Verona in the year 1755, being eighty years of age, with the well merited reputation of one of the first Italian scholars of the eighteenth century.

(Corniani, *Secoli della Letteratura Italiana*; J. Pindemonte, *Elogio di Scipione Maffei*.)

There is another but much older writer of the same name, Giovanni Maffei, who wrote a ‘History of the East Indies,’ in Latin, in 16 books, of which an Italian translation was published at Florence in 1589.

MAFRA is the name of a vast and magnificent pile of buildings, which contain a church, royal palace, and convent, situated in a bleak solitary country about 20 miles north-west of Lisbon, and about three miles from the sea-coast. It was founded by King John V. in the year 1717, in imitation of the Escurial of Spain. The plan of the edifice forms a quadrangle, measuring from east to west 760 feet, and from north to south 670 feet. In the centre of the west front is a sort of Ionic hexastyle portico, which leads to the church; and at each side is a pavilion, one for the accommodation of the royal family, the other for the patriarch of Lisbon and mitred canons. Another part of the building is the monastery, which contains 300 cells, a college, and a library, said to consist of between 40,000 and 50,000 volumes. The church is adorned with numerous columns of Carrara marble, and six very fine columns of red marble, besides large pannels and tables of perfectly black marble, highly polished. The number of apartments in the whole building is reckoned at 866, and the doors and windows at 5200. The whole of this building is vaulted and covered over with flags, forming a vast terrace. The gardens attached to the building are very extensive, and enclosed by a wall; they are well stored with a variety of exotics, imported from Asia, Africa, and America. Father Joam de Prado published a full description of Mafra in 1751. The small town of Mafra has grown up round the monastery. (Kinsey, *Portugal Illustrated*; Murphy, *Travels in Portugal*.)

MAGADOXO, or **MUKDEESHA**, a town on the eastern shores of Africa, on the coast of Ajan. The town is situated about 2° 30′ N. lat. and 45° E. long., and is the only important place on the whole coast. The harbour is formed by a long coral reef, and the town is divided into two parts, Umarween and Chamgany; the latter consists entirely of tombs. Umarween contains nearly one hundred and fifty stone houses, built in the Spanish style. It carries on some commerce with Arabia. Its exports are ivory, gum, and a particular kind of cloth; it imports sugar, dates, salt-fish, arms, and slaves. Its sovereign is dependent on the Iman of Muscat in Arabia. (Owen's *Voyages to explore the Shores of Africa, Arabia, and Madagascar*.)

MAGALHAENS, FERNANDO, commonly but incorrectly called *Magellan* was one of the most distinguished sea-officers of his time, and as a navigator and discoverer only inferior to Columbus. He was born about 1470, in some place in Alemtejo, and entered the Portuguese navy at an early age. He was afterwards sent to the East Indies, where he served for five years under Alfonso Albuquerque, and distinguished himself at the conquest of the town of Malacca in 1511. He afterwards returned to Europe, either from discontent, because the recompense which he thought due to his services, and which he had demanded, had been refused, or through fear of punishment for having embezzled some money intrusted to him. Being desirous to distinguish himself by some great enterprise, and finding that the numerous voyages to America had made it evident that this continent extended to a great distance towards the south, and being at the same time aware that the Moluccas, or Spice Islands, discovered a few years before, were situated much farther to the west, he revived the idea of Columbus of sailing to Asia by a westerly course. According to some authorities he proposed the enterprise to King Emanuel, who rejected it; but others assert that he made the proposal in the first instance to the court of Spain, where it was favourably received by Cardinal Ximenes, the regent, and afterwards approved by the emperor Charles V. A squadron of five vessels, with 236 men on board, was fitted out for that purpose, and Magalhaens left S. Lucar de Barameda on the 20th September, 1519. His object being to discover a strait or open sea, which would take him to the Moluccas, he directed his course with great judgment to the southern shores of Brazil, and entered the La Plata river, but he was soon convinced that it was not a strait. He then sailed southward, along the eastern coast of America, and was obliged to pass the winter in the harbour of S. Julian (near 50° S. lat.), where a conspiracy was formed against him. In detecting and putting down this conspiracy he showed great sagacity, prudence, and resolution. He discovered and entered the strait, which bears his name, about the end of October, 1520, and reached its western extremity on the 27th of Nov., when he entered the Pacific Ocean. He navigated the Pacific for 3 months and 20 days without finding an island, but during this course he enjoyed continuous fair weather, with such favourable winds, that he bestowed on this ocean the name of Pacific, which it still bears. The length of the voyage however reduced the crew to the greatest distress for want of food, and they began to suffer also from the scurvy. So great were their hardships, that Pigafetta, who wrote an account of this voyage, is firmly persuaded that an expedition round the world would never be undertaken again; and indeed more than fifty years elapsed between the voyage of Magalhaens and that of Drake (1577). On the 6th of March, 1521, Magalhaens arrived at a group of islands, which he called Los Ladrones, from the inclination to theft which the inhabitants displayed. After having refreshed his crew, he continued his course westward, and discovered the extensive group of the Philippines, which he called the archipelago of S. Lazaro. He induced a chieftain of the island of Zeba to acknowledge the sovereignty of the king of Spain, promising to assist him in subduing his enemies. With this view he undertook an expedition against the chieftain of the small island of Matan, but he was courageously resisted by the inhabitants, and killed in the contest. The command of his vessels devolved on Juan Sebastian del Cano, who conducted them to the Moluccas, and thence to Spain.

MAGALHAENS, STRAITS OF, commonly called the *Straits of Magellan*, is the most extensive known strait on the surface of the globe. Its length in a straight line is above 200 miles; but if the three great bends are taken into the account, it is rather more than 300 miles. It divides the continent of South America from the South American Archipelago, commonly called Tierra del Fuego. The eastern entrance is formed by Cape de las Virgines on the continent and by Cape del Espiritu Santo, or Queen Catherine's Foreland, which is on King Charles's Southland, the largest of the islands composing Tierra del Fuego. At its western entrance are Cape Pillar on the south, on the island of South Desolation, and Cape Victory on the north, on a small island belonging to Queen Adelaide's Archipelago. The most northern bend of the Strait approaches 53° 10′ S. lat., and the most southern inlet, called Admiralty Sound, 55° S. latitude. The eastern extremity of the strait is situated in about 68° 20′ W. long., and the western in about 74° 40′.

This strait may be considered as divided into three parts. The eastern part extends from Cape de las Virgines to Cape Negro, and its direction as far as the first Narrow is nearly west, but afterwards to the south of west. In two places the strait contracts to a width of five or six miles, forming the two Narrows, of which the eastern is called De la Esperanza, and the second that of S. Simon. It is extremely difficult and dangerous to pass through these Narrows from east to west, as western winds prevail in them nearly all the year round, and the western currents, which set through them, sometimes acquire such strength as to run more than seven miles an hour, a rate which approaches the rapidity of a mountain-torrent. The eastern part of the strait is not encumbered with islands and cliffs, except at its western extremity near Cape Negro, where there occurs the island of Isabella and some smaller ones, as well as some shoals. The country on both sides of this part of the strait is rather level, except that at some distance from the shore a range of hills rises on each side to a moderate height, but with rather a precipitous ascent. No trees grow in this country; the bushes are few in number and stunted, and the grass coarse though abundant.

The central portion of the strait, from Cape Negro to Cape Froward, lies north and south, and is the widest part, extending in two large inlets, called the Useless Bay and Admiralty Sound, deep into King Charles's Southland. This part of the strait is the easiest to navigate, being free from islands and cliffs, except the large island of Dawson. The country on both sides rises into high mountains, especially in the neighbourhood of Cape Froward and on the opposite coast of King Charles's Southland. Some of the peaks are above the snow-line, which here occurs at about 3500 feet above the sea-level. Mount Sarmiento on Tierra del Fuego attains the height of 6000 feet. Between the mountains there are valleys of some extent, which, as well as the lower part of the mountains themselves, are covered with a heavy growth of timber-trees.

The western part of the strait extends from Cape Froward to Cape Pillar, in a direction nearly south-east and north-west. This part is very difficult to navigate on account of its narrowness, the width varying between 5 and 25 miles, and also by reason of the numberless cliffs and islets, with which the shores, especially on the north side, are lined. To these disadvantages must be added the north-western gales, which sweep with incredible force along the channel of the strait. The mountains on each side are not so high as along the central portion, and rarely attain the snow-line; but their huge masses approach so close to the shores that in many places it is difficult to find as much level ground as is required to place a boat upon. Land-locked basins of moderate extent however occur in several places, and afford safe harbours. The mountains, which consist mostly of granite and greenstone, are irregularly heaped together; most of them for two-thirds of their height are covered with trees of a stunted growth. Two large inland salt-water lakes are united with this portion of the strait. Nearly opposite the south-eastern extremity of the large island of South Desolation [FUEGO] a channel opens eastward into the continent. This strait, called Jerome Channel, leads to Otway Water, a large inland sea 50 miles long, trending to the north-east, and separated from the eastern portion of the strait only by a narrow isthmus. From this lake another channel, called Fitzroy Channel, 12 miles long, leads in a north-west direction to another inland lake, called Skyring Water, which is about 34 miles long and 12 wide. The country bordering these lakes on the south and west is high, rocky, and mostly covered with trees; whilst that which encloses them on the east and north is a low, undulating, grassy plain, without trees.

The Strait of Magalhaens was discovered by Fernando Magalhaens in 1520. The Spanish government caused a settlement to be made on the northern shore, in the central part of the strait, by that skilful navigator Sarmiento, in 1583 or 1584. The settlement was called San Felipe, and was visited in 1587 by Cavendish, who found the settlers perishing with cold, hunger, and disease. From that time the place was called Port de Hambre or Port Famine, and was soon after abandoned.

The strait was formerly much navigated by vessels bound for the harbours on the western coast of America; but the navigation was always dangerous and tedious. Magalhaens had the good fortune to traverse it in less than thirty days, but his successors have frequently employed double or triple that time in passing through the strait from east to west. The difficulty is produced by the nearly continuous western gales, the great strength and irregularity of the currents, the numerous rocks and cliffs in the western part of the strait, and the great humidity of the climate, which engenders scurvy and other diseases. In sailing round Cape Horn only the first two difficulties are encountered, but the climate is much colder, and snow and sleet are common. The great improvements in navigation in modern times have deprived the voyage round the Cape of most of its difficulties, but they have not in the same degree lessened those which are encountered in traversing the strait. At present a vessel rarely enters the strait unless sent by some government for a special purpose.

(Cordova's *Voyage of Discovery to the Strait of Magellan;* Capt. Phillip Parker King's *Observations upon the Geography of the Southern Extremity of South America*, &c., in the *London Geogr. Journal*, vol. i.; *The Chart of the Strait of Magalhaens, surveyed by* Captain P. P. King, R.N., 1826, 1830.)

MAGAS. [BRANCHIOPODA, vol. v., p. 313.]

MAGAZINE, a strong building, constructed generally of brick or stone within a fortified place, or in the neighbourhood of a military or naval station, in order to contain in security the gunpowder or other warlike stores which may be necessary for the defence of the place, or for the use of the troops who are to perform military duty in the province or district.

On account of the liability of gunpowder to become deteriorated by humidity and by variations in the state of the air, the buildings in which it is contained are constructed with every precaution necessary to ensure dryness, and, as nearly as possible, a uniformity of temperature within them. They are generally in places remote from other buildings; they are furnished with metallic conductors, in order to avert danger from lightning; and, for security against the attempts of ill-disposed persons, they are surrounded by a wall and ditch. When in situations where they may become the objects of hostile measures, they are made shell-proof.

A magazine within the walls of a fortress is usually formed on an esplanade; and, if small, it may be in the interior of some bastion remote from the front against which an attack of the enemy is likely to be directed. But it would be preferable that such buildings should be in some work beyond the main rampart of the place, that an accident may be attended with as little detriment as possible.

The powder required for the immediate service of the works on the front attacked is taken from the general magazine, and placed in what are called *expense magazines;* that is, in temporary bomb-proof buildings, or in casemates formed in the rampart along that front, from whence it is conveyed to the batteries. These casemates or *souterreins* should be as well ventilated as possible, by having doors and windows in the interior side of the rampart, and loop-holes or small perforations on the side next to the main ditch. They sometimes constitute the only bomb-proofs belonging to a fortress; and then they become of the utmost importance, serving as well for the abode of the troops, when not on duty, as for the preservation of the powder and stores. [BOMB-PROOF; CASEMATE.] In such situations however, as magazines, they are subject to some disadvantages from which isolated buildings are free; for besides the humidity, which the means they possess for ventilation are not sufficient entirely to remove, the blowing up of any one by an accident would evidently destroy the rampart, and expose the place to the risk of an immediate assault. And when the vault springs from the back of the wall which constitutes the exterior revêtment of the rampart on any face of the work, its lateral pressure would facilitate the formation of a breach by overturning the wall as soon as the latter became weakened by the fire from the enemy's battering artillery.

The dimensions of magazines are necessarily dependent on the quantity of powder which they may be required to contain. Vauban, in his 'Traité sur la *Défense des Places*,' speaking of such as are made in the ramparts of fortresses, recommends them to be from eight to twelve feet wide, with semicircular-headed vaults; and he proposes that the barrels of powder should be placed in them in two rows, with a passage from three to four feet wide along the middle. The great magazines which have been constructed in this country consist of several parallel vaults, separated from each other by brick partition-walls, in which are doorways for affording lateral communication. Each vault is about ninety feet long and nineteen feet wide internally, and it has a door at each extremity. The side walls are from eight to ten feet thick, and are strengthened by buttresses built at intervals against them. The concave or interior surface of each vault, in a vertical and transverse section, is nearly of a parabolical figure, above the springing courses; and the exterior surface has the form of two inclined planes meeting in a longitudinal ridge-line above the middle of the vault. The thickness of the brickwork forming the vaulted roof is therefore various: at the crown it is seven or eight feet, and on the hances about three feet, this being considered sufficient to resist the shock of falling shells. The vault, on the exterior of the inclined planes, is covered with flat tiles, and the gutter between every two roofs with sheet-lead or copper. The height interiorly, from the level of the floor to the crown of the arch, is nineteen feet; and the lines at which the vaulting springs from the side walls are at half that distance above the floor. The narrow vertical perforations which are made through the side and end walls, for the purpose of giving air to the interior, are cut so as to leave a solid block or traverse of the brickwork in the middle of the thickness of the wall; the line of the perforation branching laterally from its general direction, and passing along the two sides of the traverse. By this construction, while air is admitted, no object capable of doing mischief can be thrown in from the exterior of the building. The flooring-planks are, of course, laid on joists raised considerably above the ground. One vault, of the dimensions above given, would contain 2500 barrels, or 225,000 lbs. of powder.

When the roof of a magazine is covered with earth to the height of several feet, for the purpose of securing it effectually against the effect of falling shells, the rain-water absorbed by the earth may at length penetrate through the brickwork to the interior of the building. In order to prevent this effect it has been proposed that the roof should be covered with common hollow tiles, having their concave surfaces upwards, and that, over these, boards should be laid to carry the earth. The absorbed water would thus drain off in the channels formed by the tiles, and be conveyed away by the gutters between the roofs.

MAGDALEN COLLEGE, Oxford, was founded in 1456, by William of Waynfleet, successively head master of Winchester and Eton schools, and provost of Eton, bishop of Winchester, and at the same time lord high chancellor of England, for a president, 40 fellows, 30 scholars called *Demies*, a schoolmaster, an usher, four chaplains, an organist, eight clerks, and 16 choristers. Of the Fellows five must be of the diocese of Winchester; seven of the county of Lincoln; four of the county of Oxford; three of the county of Berks; four of the diocese of Norwich; two of the diocese of York or Durham, one of the county of York, but in both cases with preference to priests; two of the diocese of Chichester; two of the county of Gloucester; two of the county of Warwick; one of the county of Buckingham; one of the county of Kent; one of the county of Nottingham; one of the county of Essex; one of the county of Somerset; one of the city of London; one of the county of Northampton; one of the county of Wilts. The Demies may be elected from any of the above-mentioned dioceses or counties, with the exception of York and Durham. The Visitor is the Bishop of Winchester.

The patronage of this College consists of rectories and vicarages in different counties, with two perpetual curacies, thirty-seven in number.

The number of members upon the college books in 1838 was 197.

Among the eminent persons who received their education at this college are cardinals Wolsey and Pole, bishops Warner, Hough, and Horne, dean Colet, Linacre, Lily the grammarian, Fox, the martyrologist, Godwin, the Hebrew antiquary, Sir Thomas Roe, Hampden, Dr. Hammond, Dr. Heylin, Elisha Coles, Dr. Thomas Smith, Addison, Gibbon, and Dr. Chandler.

Magdalen College stands upon a plot of ground at the entrance of Oxford from London, bounded on its east side by the Cherwell. The buildings are extensive. In one corner of the entrance court stands the stone pulpit from which the University sermon on St. John the Baptist's day used to be preached. This court leads into a larger quadrangle, which contains the chapel, hall, and library. South of the chapel and on the south side of what is called the Chaplain's court stands the tower of the college, the beautiful proportions of which render it one of the chief ornaments of Oxford. The great quadrangle was begun by the founder in 1473, though not finished till after his death. The foundation of the tower was laid in 1492. Previous to the Reformation a mass of requiem for the soul of Henry VII. used to be performed upon the top of this tower every May-day early in the morning; this was afterwards commuted for a few pieces of music, which are still executed on that day by the choristers, for which the rectory of Slimbridge in Gloucestershire pays annually the sum of 10*l.* The foundations of what are called the 'New Buildings' of this college, on the north side of the great quadrangle, were laid in 1733.

The chapel of this college, which had been refitted and decorated in an incongruous manner in the time of Charles I., was restored to its former magnificence under the direction of Mr. Cottingham in 1833. The fine picture of 'Our Saviour bearing his Cross,' over the communion table, ranks among the best paintings in Oxford. It has been attributed by some to Guido, and by others to Ludovico Caracci, but it is now given to Moralez. It was brought from Vigo in 1702.

(Gutch's *Coll. and Halls of Oxford;* Chalmers's *Hist. of the Univ. of Oxf.*, 8vo. Oxf., 1810; *Oxford Univ. Calendar*, 1838.)

MAGDALEN HALL, Oxford. The school, with the refectory and chambers erected by Bishop Waynfleet for students previous to admission into his college, and adjoining its buildings, obtained the appellation of St. Mary Magdalen Hall as early as 1487, and was governed by one of the Fellows till 1602, when it became an independent hall. The President and Fellows of Magdalen College, being desirous of recovering this site, obtained, in 1816, an act of parliament which authorised them to prepare for the reception of this society Hertford College, which had lapsed to the crown, and the Principal and other members removed there on its completion in 1822.

This Hall is possessed of one benefice, the rectory of South Moreton in Berkshire. It has also several exhibitions and scholarships, open to competition, left by different founders.

The original foundation of Magdalen Hall boasted among the names of its more eminent members those of bishop Wilkins, Warner and Daniel the poets, Sir Harry Vane, Sir Julius Cæsar, Lord Clarendon, Sir Matthew Hale, Sydenham, Dr. Pocock, afterwards of Corpus College, Dr. Hickes, afterwards of Lincoln, Dr. Plot, Sir George Wheler, and Dr. Nichols, the commentator on the liturgy.

The buildings of the old Hall were destroyed by an accidental fire, Jan. 9th, 1820.

(Chalmers, *ut supr.*, vol. ii. 453; *Oxford Univ. Calendar*, 1838; *Gent. Mag.*, vol. xc., P. ii., p. 78.)

MAGDALEN COLLEGE, Cambridge, was built by Edward Stafford, duke of Buckingham, in the year 1519, under the name of Buckingham House, on the site of an antient hostel belonging to the abbeys of Ely, Ramsey, and Walden, in which some of the monks of those monasteries resided from time to time. At a much more remote date it is supposed by some to have been the original site of Barnwell Priory. The Duke of Buckingham not having completed the building at the time of his attainder, the college fell to the crown and was granted to Thomas, lord Audley, lord high chancellor of England, who in 1542 endowed it for a Master and four Fellows.

Beside the foundation fellowships left by lord Audley, this College has thirteen bye-fellowships; one of them is a travelling fellowship left by the Rev. Drue Drury, worth upwards of 200*l.* per annum, but tenable for only nine years, and appropriated to the county of Norfolk. The Master has the sole appointment to this fellowship, and the holder must be in holy orders or designed for such.

The mastership of this College is in the gift of the possessor of Audley End.

Beside the fellowships, there are 43 scholarships belonging to this College, founded by different benefactors, some of considerable, others of smaller value; four of them are appropriated to Shrewsbury school; two to natives of Shropshire; two to scholars from Wisbeach school; four to Leeds, Halifax, and Haversham schools; and one to King's College, London.

The foundation-estate of lord Audley consists of the impropriate parsonage of St. Catharine Cree Church, in London, and also a considerable part of the city antiently called Covent Garden Christ Church. The benefices in the gift of the College, exclusive of the vicarage of St. Catharine Cree in London, are, the rectory of Stanton St. Michael in Cambridgeshire, the rectories of Anderby and Comberworth united, and the perpetual curacy of Grainthorpe in Lincolnshire; the rectory of Ellingham in Norfolk (annexed to the mastership by act of parliament); the rectory of Aldrington in Sussex, and the vicarage of Steeple Ashton in Wilts. The Master has the sole patronage of Steeple Ashton.

Among the eminent persons who have been members of Magdalen College are lord keeper Bridgman, bishop Walton, editor of the Polyglot Bible, Dr. Howell, the historian, bishop Cumberland, and Dr. Daniel Waterland.

This College, which stands on the north side of the Cam, consists of two small courts. On the north side of the second is a stone building, the body of which is appropriated to the reception of the Pepysian Library. This library was bequeathed to the College by Samuel Pepys, Esq., Secretary of the Admiralty in the reigns of king Charles II. and king James II., and is one of the most interesting in the University. Its contents are matchless both in variety and condition. With a few exceptions in morocco and vellum, they are all in a uniform binding in calf, gilt. Beside numerous manuscripts, this library is remarkably rich in works from the presses of Caxton, Wynkyn de Worde, and other early English printers. It contains a curious collection of engraved English portraits, numerous topographical prints and drawings, and a very rare and extensive collection of early ballads. There is an enumeration of some of the most interesting works in this library in Hartshorne's *Book Rarities in the University of Cambridge*, 8vo., London, 1829, p. 217-269.

The number of members on the boards of this College, March 12, 1838, was 188.

(Lysons's *Cambridgeshire*, pp. 123, 124; *Cambridge University Calendar* for 1838.)

MAGDALE'NA, River. [Granada, New.]

MAGDEBURG, one of the three governments of the Prussian province of Saxony, is composed of the antient duchy of Magdeburg, the county of Barby, the bailliwick of Gommern (without the circle of the Saal), the Altemark (Old Mark), on the left bank of the Elbe, the bailliwick of Klötze, the principality of Halberstadt, with Derenburg, Quedlinburg, Wernigerode, and Schauen. Its area is 4410 square miles, and the population, according to the census of 1837, amounted to 598,981. The government is divided into fifteen circles. The country is one of the finest parts of the Prussian monarchy, consisting chiefly of a fertile and level tract; the hills in the south-west, which are offsets of the Harz, are low, and in other parts the surface is merely varied by gentle elevations. [Saxony, Prussian Province of.]

The duchy of Magdeburg is not to be confounded with the government of the same name; which contains only a part of the duchy, the other part being in the government of Merseburg.

MAGDEBURG, the capital not only of the government but of the province of Saxony, is situated on the left bank of the main arm of the Elbe, in 52° 8′ N. lat. and 11° 39′ E. long. It is a fortress of the first rank, and one of the most important bulwarks of the Prussian monarchy. The city consists of four parts and two separate suburbs:—1, The old town, or principal fortress along the Elbe, with eleven bastions and ten small ravelins between them, with various other works. They are everywhere strengthened by a double, and in some parts by a triple-covered way, and by mines. South of the old town lies—2, the Stern, a square casemated tenaille, built under Federick II. by General Wallrave, who died here in a prison erected by himself, where he was confined for treachery. Between the Stern and the old town there was formerly a suburb called Sudenburg, which was pulled down in 1811 by the French, who built on the site Fort Napoleon, now called Fort Scharnhorst. The long bridge, over the broadest arm of the Elbe, leads from the city to—3, the citadel, built in 1680, on an island, by king Frederick I. Over the two smaller arms of the Elbe, beyond it, there are drawbridges; and beyond lies —4, Friedrichstadt, or Thurmschanze (*i.e.* Tower Fort), which defends the entrance on the right bank of the Elbe, where the newly-built Frederick-William bridge, 1080 feet long, leads over the low ground on the bank of the river. The suburb of Neustadt, lying to the north, as being too near to the fortifications, was partly destroyed in 1806 by the Prussians, and entirely demolished in 1811 and 1812 by the French, together with the adjoining suburb of Sudenburg. It has been partly rebuilt since 1818.

Magdeburg, like most old continental towns, has in general narrow and crooked streets, but having been rebuilt since its destruction by Tilly in 1631, it is better constructed than many antient cities. Among the more remarkable buildings are—the townhall, built in 1691, the ducal palace, the provincial assembly-house, the artillery barracks, the government-house, and the theatre. The celebrated cathedral was completed in 1363, after having been 150 years building. It has two steeples 350 feet high, a lofty nave supported by twelve pillars, a high altar of jaspar, forty-five smaller altars, a pulpit of alabaster, and a font of one block of porphyry. There are twelve churches, one of which is Roman Catholic. There are two large squares, the old market-place, in which is the statue of the emperor Otho the Great, erected in 973, and the cathedral square, which is surrounded by handsome buildings and avenues of trees. The public establishments and charitable and scientific institutions are numerous and well conducted; and as the city, with a population of 50,000, is the capital of the province of Saxony, as well as of the government and circle, the residence of the chief president[*], of a Protestant bishop, and the head-quarters of the fourth corps of the Prussian army, with several public libraries, collections of pictures, literary and other clubs, and all kinds of public amusements, such as theatres, balls, concerts, &c., it is accounted a very agreeable place of residence. It has also considerable manufactures, extensive breweries and distilleries, and a very active trade. Magdeburg is rich in historical recollections; the most celebrated and unfortunate event in its annals is its capture by storm on the 10th of May, 1631, by the Austrian general Tilly, when it was given to pillage for three days, and 30,000 of the inhabitants were put to the sword; the whole city, except the cathedral, one of the churches, and about 130 houses, was at the same time reduced to ashes.

(Rathmann, *Geschichte der Stadt Magdeburg*; Schiller *Thirty Years' War*; Hassel, Stein, &c.)

MAGELLAN. [Magalhaens.]

MAGELLANIC CLOUDS. [Nebulæ.]

MAGGIO'RE, LAGO. [Lago Maggiore.]

MAGI, the name of the priests among the Medes and Persians, whose religious doctrines and ceremonies are explained under Zoroaster. The Magi formed one of the six tribes into which the Medes were originally divided (Herodot. i. 101); but on the downfall of the Median empire they continued to retain at the court of their conquerors a great degree of power and authority. It would appear however that they did not witness with indifference the sovereignty pass from the Medes to the Persians; and it was probably owing to the intrigues of the whole order that a conspiracy was formed to deprive Cambyses of the throne by representing one of their order as Smerdis, the son of Cyrus, who had been previously put to death by his brother. Herodotus, who has given the history of this conspiracy at length, evidently regarded it as a plot on the part of the Magi to restore the sovereignty to the Medes, since he represents Cambyses on his death-bed as conjuring the Persians to prevent the Medes from obtaining the supremacy again (Herodot., iii. 65); and the Persians themselves must have looked upon it in the same light, since after the discovery of the conspiracy, and the murder of the pretended Smerdis by Darius Hystaspes and his companions, a general massacre of the Magi ensued; the memory of which event was annually preserved by a festival, called the 'Slaughter of the Magi' (*Μαγοφόνια*), in which none of the Magi were allowed to appear in public. (Herodot., iii. 79; Ctesias, *Pers.*, c. 15.) This event does not appear to have much impaired their influence and authority, for they are represented by Herodotus, in his description of the Persian religion, as the only recognised ministers of the national religion (i. 132).

The learning of the Magi was connected with astrology and enchantment, in which they were so celebrated that their name was applied to all orders of magicians and enchanters. Thus the Septuagint translates the Chaldee enchanter,' by the word *Magus*, *μάγος*. (*Dan.*, i. 20;

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[*] The Prussian governments, or provinces, have each a regency, at the head of which is a chief president.

; compare *Acts*, xiii. 6, 8.) The word was also ap- designate any men celebrated for wisdom; whence › men of the East who came to see Christ are called Magi. (*Matt.*, ii. 1, 7, 16.)

uld appear from a passage in *Jeremiah* (xxxix. 3), e Babylonian priests were also called Magi, if at e interpretation of *Rab-Mag* (רַב-מָג), 'chief of the

›e correct. (Gesenius, *Hebrew Lexicon*, under מָג.)

tymology of this word is doubtful. In Persian the ›r priest is *mugh*; and it is not improbable, as s has conjectured, that the word may be connected 'e root meaning *great*, which we have in the Greek the Latin *mag-is* and *mag-nus*, the Persian *mih*, › Sanskrit *mah-at*. It is a curious fact that the grammarians derive *mah-at* from a verb *mah*, signi- o worship.' (Wilson's *Sanskrit Dictionary*, under

IC SQUARE. This term is applied to a set of › arranged in a square in such a manner that the horizontal, and diagonal columns shall give the ms. Such arrangements were known very early to dus, Egyptians, and Chinese, among whom, as also he Europeans of the middle ages, a belief existed h squares had astrological and divinatory qualities. l Moschopulus,* of Constantinople, wrote on them ; in the middle of the fifteenth century. Others ve written on the subject are Leibnitz, Frenicle, La Hire, Saurin, &c. (See Montucla's *History*, . 346; *Encyclopédie Méth.*, article 'Quarrés ma- Hutton's *Dictionary*; and the *Mathematical Re-* › of the same author.)

h the question of magic squares is in itself of no it belongs to a class of problems which call into beneficial species of investigation. Without laying y rules for their construction, we shall content our- th destroying their magic quality, and showing nonexistence of such squares would be much more g than their existence.

iny set of numbers in arithmetical progression, and t their number shall be a square number: say the ›en numbers—

1	2	3	4	5	6	7	8
16	15	14	13	12	11	10	9

of these in the first half, with its corresponding n the second half, makes up 17. Write the num- ›e following manner:—

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

'our of these in such a manner as to take one out row, and one out of each column, and it will be ıd may easily be proved, that the sum of numbers ›uch set must consist of two pairs of corresponding , so that their sum must be twice 17, or 34. The ways in which this can be done are in number 2 × 1, or 24, as follows:—

1	16	5	2	11	16	9	2	7	16	13	2	7	12
5	12	5	2	15	12	9	2	15	8	13	2	11	8
7	16	5	10	3	16	9	6	3	16	13	6	3	12
8	15	5	10	15	4	9	6	15	4	13	6	11	4
7	12	5	14	3	12	9	14	7	4	13	10	7	4
1	8	5	14	11	4	9	14	3	8	13	10	3	8

these subdivisions a set may be taken from each, › number shall be repeated, in 24 different ways, as llowing sample, which shows the four ways that h 1 6 11 16.—

1	16	1	6	11	16	1	6	11	16	1	6	11	16
5	12	5	2	15	12	5	10	15	4	5	14	3	12
7	4	9	14	3	8	9	14	3	8	9	2	15	8
3	8	13	10	7	4	13	2	7	12	13	10	7	4

ı each of these 24 squares, every horizontal row ritten in 24 orders [COMBINATIONS], and in putting the different orders together, each square admits of 24 × 24 × 24 × 24, or 331,776 arrangements, without altering the horizontal rows, but only the order of the figures in each row. But the order of the horizontal rows can be varied 24 ways in each square, and there are 24 squares; so that we have 331,776 × 24 × 24, or 191,102,176 squares, no one of which repeats any number more than once, and in every one of which the sum of any horizontal row is 34, made by two pairs of numbers which give 17 each. But the number of ways of forming 34 out of four of the first sixteen numbers is not yet exhausted: for, taking any one set, say

1 16. 11 6

in which 1 and 6 correspond to 16 and 11, we may write 2 and 5, or 3 and 4, for 1 and 6, so that we have not included in the preceding list

2 16 11 5
3 16 11 4

with all their variations of order; and similar ones for all the rest of the list. It would be almost impossible to doubt that in many of this enormous number of squares, the vertical columns will sometimes be cases of these new sets: and it would be something short of magic if some should also have diagonal columns which fulfil the same condition. In fact, Frenicle has shown 880 methods of making these squares magical, a few of which are as follows (*Divers Ouvrages*, &c., Paris, 1693):—

1	16	11	6	4	11	14	5	13	4	5	12	16	3	10	5
13	4	7	10	6	13	12	3	16	6	11	1	8	2	13	11
8	9	14	3	9	2	7	16	3	9	8	14	9	15	4	6
12	5	2	15	15	8	1	10	2	15	10	7	1	14	7	12
8	12	5	9	8	10	3	13	8	12	5	9	10	11	5	8
11	1	16	6	15	1	12	6	10	1	16	7	15	2	16	1
13	7	10	4	9	7	14	4	13	6	11	4	6	7	9	12
2	14	3	15	2	16	5	11	3	15	2	14	3	14	4	13

In Frenicle's list of 880, only those squares are included which are essentially different: thus the following four, which may be made by turning the last square into different positions, count only as one.

10	11	5	8	8	1	12	13	13	4	14	3	3	6	15	10
15	2	16	1	5	16	9	4	12	9	7	6	14	7	2	11
6	7	9	12	11	2	7	14	1	16	2	15	4	9	16	5
3	14	4	13	10	15	6	3	8	5	11	10	13	12	1	8

The methods which have been given for the formation of magic squares are divided into different rules, according as the number in each side is odd, evenly even, or oddly even. A general method which shall apply to all cases is yet wanting. For a full account of these rules see Hutton's *Mathematical Recreations*.

MAGI'LUS, De Montfort's name for a genus of testaceous mollusks, the form of whose shell varies very much according to its different stages of growth and the circumstances in which it is placed.

The genus was placed by Lamarck among his *Annelids*, in the family *Serpulacea*, containing the genera *Spirorbis*, *Serpula*, *Vermilia*, *Galeolaria*, besides that under consideration.

M. de Blainville arranged it among the mollusca (family *Cricostomata*), between *Siliquaria* and *Valvata*, observing at the same time that Guettard clearly saw the relation of the form to *Vermetus*.

Cuvier, in his last edition of the 'Règne Animal,' gives it a position between *Vermetus* and *Siliquaria*, in his seventh order of Gastropods (*Tubulibranchiata*).

M. Rang remarks that when he was seeking the animal in India he was struck, like M. de Blainville, with the analogy which the genus presents not only to *Vermetus*, but also to many other genera of *Pectinibranchiata*. This analogy, M. Rang further observes, is especially remarkable when a young individual whose shell has not yet become tubular is examined.

Description.—Animal:—M. Rang states that he saw some fragments of the animal, and that it is certainly a Gastropod. In his description however he notes the animal as unknown. Dr. Rüppell states that it is furnished with an operculum.

Shell.—Young:—Fragile, with an epidermis, pyriform, ventricose, with a short spire of from three to four turns; aperture longer than it is wide, oblong, without any notch

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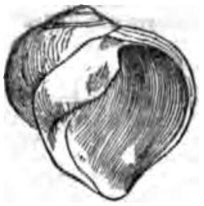
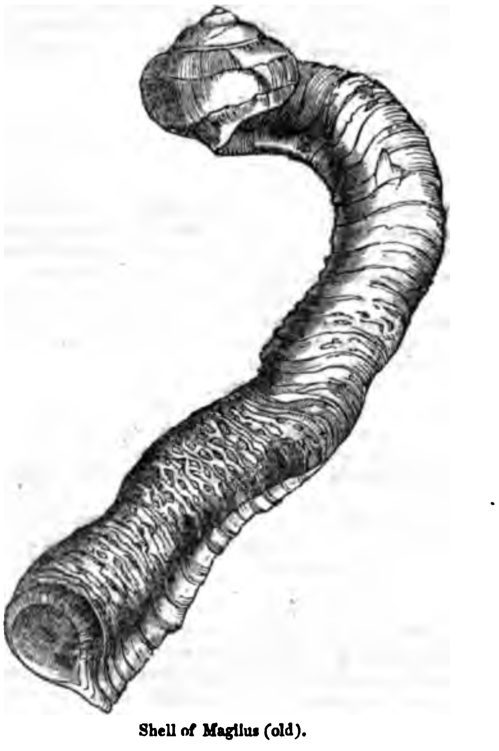
ink this work was written by Emanuel Moschopulus the elder, a › lived at the end of the thirteenth century.

anteriorly, where the lip nevertheless forms an angle. Dr. Rüppell thinks that M. Rang, when he wrote the above description, had before him the young of *Leptoconchus*. Adult:—The last whorl abandoning altogether the spiral form to produce an elongated tube, which is irregularly sinuous, or irregularly contorted, conical, compressed laterally, especially on the side of the base of the shell, carinated beneath, and free; aperture elliptical.



Shell of Magilus (young).

When in this state the shell presents all the characters of a regularly spiral univalve. The animal establishes itself in the excavations of Madrepores (*Astrææ*, &c.), and as the coral increases around it the *Magilus* is obliged, in order to have its aperture on a level with the surrounding surface, or near it, to construct a tube, which is more or less eccentric according to circumstances, the growth of the coral determining the length of the tube. As this tube goes on increasing, the animal abandons the spiral for the tubular part of the shell, and in this operation it leaves behind no *septa*, or partitions, but secretes a compact calcareous matter which reaches to the very summit of the spiral part, and is deposited from time to time as the tube is lengthened; so that in an old specimen the posterior part of the shell presents a solid and almost crystalline mass. Indeed the fracture of this mass is radiated and saccharoid. One species only, *Magilus antiquus*, is known. The colour is white, more or less pure.



Shell of Magilus (old).

The reader will find the differences between *Magilus* and *Leptoconchus*, as stated by Dr. Rüppell, in the article on the last-named genus.

MAGINDANAO. [Philippine Islands.]

MAGLIABE'CCHI, ANTO'NIO, born at Florence in 1633, early showed a great aptitude for philological and historical studies; he was an indefatigable reader, and had a prodigious memory. He employed his scanty savings in buying books, and gradually collected a vast library, which since his death has become the property of the city of Florence, and is open to the public, and known by the name of Magliabecchiana.

Magliabecchi, in consequence of his immense erudition, was considered as an oracle, and was consulted by scholars from every part of Europe. Several princes showed by compliments and gifts their regard for him. His own sovereigns, the grand-dukes Medici, appointed him their librarian. Magliabecchi left no work of his own. Some of his letters have been published in various collections: 'Lettere di Uomini Illustri,' Macerata, 1782; 'Lettere di Uomini Dotti,' Venezia, 1807; 'Prose Fiorentine,' &c. Unfortunately Magliabecchi was very vain, irritable, and abusive, and his temper involved him in personal quarrels with several of his contemporaries. He died at Florence, in 1714, at eighty one years of age.

MAGNA CHARTA. The terms of the compact between the feudal chief and his dependants underwent frequent changes in the middle ages, the consequence for the most part of resistance made by the tenants, and struggles to regain liberties which had been originally surrendered or taken from them by the force and power of the chief. When a material alteration was made in the terms of the compact, a record was made of it in writing. These records are called charters, in the restricted use of a term which is popularly applied to almost every species of early diplomas. The tenants of the various honours, or great tenancies in capite, are seldom without one or more charters which have been granted to them by their lords, by which exemptions or privileges are given, base services are commuted for payments in money, and the mode is settled in which justice shall be administered among them. And even in some of the inferior manors there are charters of a similar kind by which certain liberties are guaranteed by the lord to his tenants. These charters run in the form of letters, '*Omnibus*,' &c. from the person granting; they set forth the thing granted, and end with the names of persons who were present when the lord's seal was affixed, often ten, twelve, or more, with the date of place and time of the grant.

Such a charter is that called the Magna Charta granted by King John, but acting in his twofold character of the lord of a body of feudatories, and the sovereign of the realm. This charter is often regarded as the constitutional basis of English liberties, but in many of its provisions it seems to have been only a declaration of rights which had been enjoyed in England before the Conquest, and which are said to have been granted by King Henry I. on his accession. However, if it did not properly found the liberties which the English nation enjoys, or if it were not the original of those privileges and franchises which the barons (or the chief tenants of the crown, for the names are here equivalent), ecclesiastical persons, citizens, burgesses, and merchants enjoy, it recalled into existence, it defined, it settled them, it formed in its written state a document to which appeal might be made, under whose protection any person who had any interest in it might find shelter, and which served, as if it were a portion of the common law of the land, to guide the judges to the decisions they pronounced in all questions between the king and any portion of the people.

Beside the great charter there was granted at the same time a charter relating to the forests only. There were very extensive tracts of land in England which were actually forests, uncultivated, and reserved for the pleasure of the king; and there were purlieus to these forests, all of which were subject to a peculiar system of law, many parts of which were felt to be oppressive, and from some of which this charter exempted the people.

The independence and rights of the church were also secured by the great charter.

Magna Charta has been printed in a great variety of forms; there are fac-similes of a copy of it which was made at the time, and still exists in the British Museum, and of another preserved at Lincoln, and translations of it into the English language. It is thus so easily accessible, that it will not be expected that we shall give a copy of it, or even a complete abstract of its multifarious provisions, some of which are completely obsolete, and the terms obscure. Instead of this, we shall give the satisfactory abridgement of Blackstone, in his 'Commentaries,' who has besides an express treatise on this charter.

'The great charter,' says he, 'confirmed many liberties of the church, and redressed many grievances incident to feodal tenures, of no small moment at the time; though now, unless considered attentively and with this retrospect, they seem but of trifling concern. But besides these feodal provisions, care was also taken therein to protect the subject against other oppressions, then frequently arising from unreasonable amercements, from illegal distresses or other process for debts or services due to the crown, and from the tyrannical abuse of the prerogative of purveyance and pre-emption. It fixed the forfeiture of lands for felony in the same manner as it still remains; prohibited for the future the grants of exclusive fisheries, and the erection of new bridges so as to oppress the neighbourhood. With respect to private rights: it established the testamentary power of the subject over part of his personal estate, the rest being distributed among his wife and children; it laid down the law of dower as it hath continued ever since; and prohibited the appeals of women, unless for the death of their husbands. In matters of public policy and national concern, it enjoined an uniformity of weights and measures; gave new encouragements to commerce by the protection of merchant-strangers, and forbad the alienation of lands in mortmain. With regard to the administration of justice: besides prohibiting all denials or delays of it, it fixed the Court of Common Pleas at Westminster, that the suitors might no longer be harassed with following the king's person in all his progresses; and at the same time brought the trial of issues home to the very doors of the freeholders, by directing assizes to be taken in the proper counties, and establishing annual circuits; it also corrected some abuses then incident to the trials by wager of law and of battle; directed the regular awarding of inquests for life or member; prohibited the king's inferior ministers from holding pleas of the crown, or trying any criminal charge, whereby many forfeitures might otherwise have unjustly accrued to the exchequer, and regulated the time and place of holding the inferior tribunals of justice, the county court, sheriff's tourn, and court-leet. It confirmed and established the liberties of the city of London, and all other cities, boroughs, towns, and ports of the kingdom. And lastly (which alone would have merited the title that it bears of the *great* charter), it protected every individual of the nation in the free enjoyment of his life, his liberty, and his property, unless declared to be forfeited by the judgment of his peers or the law of the land.'

Such a concession from the king was not gained without a violent struggle; in fact he was compelled to yield it by an armed force, consisting of a very large portion of the baronage, which he was far too feeble to resist with effect. The names of the chiefs are preserved by the chroniclers of the time, and in the charter itself; and whenever recited, they call up to this day a mingled feeling of respect and gratitude, the respect and gratitude which men pay to those who have obtained for them the extension of political privileges, though it may appear that those privileges were nothing more than rights of which they had been deprived, and to which therefore they may be said to have been justly entitled. They appear the patriots of a rude age, and the mists of distance and antiquity obscure to us the selfishness and the other evils (if such existed) which were manifested in the contest. The first name is that of Robert Fitz Walter, who belonged to the great family of Clare. The title given to him as head of the host was Marshal of the Army of God and of the Holy Church. Next to him come Eustace de Vesci, Richard de Percy, Robert de Roos, Peter de Brus, Nicholas de Stutevile, Saier de Quenci, earl of Winchester, the earls of Clare, Essex, and Norfolk, William de Mowbray, Robert de Vere, Fulk FitzWarine, William de Montacute, William de Beauchamp, and many others of families long after famous in English history, the progenitors of the antient baronial houses of England.

The charter was signed, or rather sealed, not in any house, but in the open field, at a place called Runnymede, between Windsor and Staines; but it was not merely by an accidental meeting of two armies at that place that this act was done there, for it appears by Matthew of Westminster that Runnymede was a place where treaties concerning the peace of the kingdom had been often made. All was done with great solemnity. The memorable day was June 5, 1215.

What was unwillingly granted, it could scarcely be expected would be religiously observed. John himself would gladly have infringed or broken it, as would his son King Henry III., but the barons were watchful of their own privileges, those of the church, the cities, the boroughs, and of the people at large; and King Henry was led to make one or more solemn ratifications of the charter. To keep the rights thus guaranteed fully in the eyes of the people a copy was sent to every cathedral church, and read publicly twice a year.

See the work of Sir William Blackstone, entitled 'The great Charter and Charter of the Forest, with other authentic Instruments; to which is prefixed an Introductory Discourse concerning the History of the Charters,' Oxford, 1759, 4to. The late Board of Commissioners on the public Records caused to be engraved and published an exact fac-simile of the charter, from a copy preserved in the archives of the cathedral church of Lincoln, with other of the greater charters. In the first volume of their work, entitled 'The Statutes of the Realm,' these charters are all printed, with English translations of them.

MAGNA GRÆ'CIA, or MAJOR GRÆCIA (Liv., xxxi. 7; Justin, xx. 2), was used to designate the south of Italy, in consequence of the numerous and flourishing colonies which were founded by the Greeks in that part of the country. There is some difficulty in determining how far north this name extended; but it does not appear to have been applied to the country beyond Cuma and Neapolis; and some geographers have thought, though without sufficient reasons, that it was confined to the colonies on the Gulf of Tarentum. Pliny apparently considers Magna Græcia to begin at the Locri Epizephyrii (*N. H.*, iii. 15); but Strabo even includes the Grecian towns of Sicily under this name (vi. 175, *Casaubon*, 1587).

The time in which the name of Magna Græcia was first applied to the south of Italy is uncertain. It does not occur, as far as we are aware, in the early Greek writers, Herodotus, Thucydides, &c.; but it is used by Polybius (ii. 126, B, *Casaubon*) and succeeding Greek and Roman writers.

Taking the name in the widest signification which is given to it by Strabo, Magna Græcia may be justly considered as an appropriate name; since it contained many cities far superior in size and population to any in Greece itself. The most important of these places were, Tarentum, founded by the Lacedæmonians; Sybaris, Croton, and Metapontum, by the Achæans; Locri Epizephyrii, by the Locrians; and Rhegium, by the Chalcidians—all in Italy; and in Sicily—Syracuse, founded by the Corinthians; Gela, by the Cretans and Rhodians; and Agrigentum, by the inhabitants of Gela.

MAGNE'NTIUS, commander of the Roman army in Gaul, revolted against Constans, son of Constantine the Great, and emperor of the West, and caused him to be killed near the Pyrenees, A.D. 350. Constantius, the brother of Constans, and emperor of the East, marched against Magnentius, and a battle was fought between them on the banks of the Drave, A.D. 351. Magnentius, being defeated, fled to Italy, from whence he escaped into Gaul, where Constantius followed him and defeated him again, A.D. 353. Magnentius, finding himself forsaken by his troops, killed himself; and his brother Decentius, whom he had made Cæsar, followed his example. Constantius thus became sole master of the whole empire.

British Museum. Actual Size. Copper.

MAGNE'SIA. [ANATOLIA.]

MAGNESIA. [MAGNESIUM.]

MAGNESIA, MEDICAL PROPERTIES OF. Oxyde of magnesium, termed also, from the mode of procuring it, calcined magnesia, or magnesia usta, is an alkaline earth possessing the usual qualities of alkalies in their habitudes with acids, and likewise the peculiar property of exciting generally purgative action of the intestines. This last-mentioned power gives it a distinctive character among alkaline remedies, as it can be employed not merely to counteract acidity, but also to remove the exciting cause when that consists in the presence of crude or undigested acid-yielding materials in the stomach. Its action as a purgative seems mainly to depend upon its meeting with acids in the stomach, and so forming soluble salts. When these are not present the magnesia remains undissolved, and if used repeatedly may accumulate in the intestines, and, becoming agglutimated by the mucous secretions, give rise to much uneasiness. [Antacids.] When however acidity exists, either along with constipation or diarrhœa, more particularly in children, from the milk disagreeing, or from a diet unsuited to their delicate organs of digestion being forced upon them, magnesia is a very proper medicine, especially as it appears to possess a specific power of diminishing gastro-intestinal irritation. (Hufeland, quoted in Pereira's *Materia Medica.*) It is generally expedient to add rhubarb to it, and combine it with some carminative. In such a state of combination it is peculiarly useful in what is termed diarrhœa crapulosa, arising from too great a mixture or too large a quantity of food.

Where it is determined to use magnesia, and sufficient acid does not exist in the stomach to ensure the formation of a soluble salt, a little lemon-juice may be added to it. The subcarbonate of magnesia has nearly the same action as the calcined magnesia, but when it meets with acids in the stomach effervescence takes place, accompanied with a disengagement of carbonic acid gas, which in some cases is inconvenient, in other instances extremely beneficial. In some almost uncontrollable irritations of the stomach, where food and medicines are alike rejected, subcarbonate of magnesia will be retained, and, by allaying the irritability, allow other remedies to be subsequently employed. Both the subcarbonate and the calcined magnesia are much used to correct heartburn, and to check the lithic acid diathesis; but their employment requires much judgment and attention. [Antacids; Antalkalies.]

Sulphate of Magnesia, or Epsom salts, in the ordinary form, as met with in the shops, are small acicular crystals. This renders them liable to be confounded with those of oxalic acid; to avoid which the sulphate may be dissolved, and by recrystallization they are obtained in large four-sided prisms, or four-sided pyramids. The taste of sulphate of magnesia is bitter and very unpleasant; but this is very much lessened by large dilution in water, which at the same time increases the purgative action of the salt, or by adding magnesia, or by giving it in compound infusion of roses and adding a few drops of dilute sulphuric acid, which augments the refrigerating property of the medicine. The addition of a little common salt to a solution of sulphate of magnesia increases its cathartic powers.

No saline medicine is so extensively employed as the sulphate of magnesia as a purgative; it is more rarely used as a diuretic or diaphoretic. Its action as a purgative is in general mild and certain, causing a considerable evacuation of the serous secretions of the intestines, and so producing a cooling or lowering effect. At the commencement of most inflammatory complaints and of fevers its employment is most beneficial. Its utility is often much increased by adding to the solution a very minute portion of tartarized antimony, so as to form the emetico-cathartic solution, which was very serviceable in the fevers of India, and in those of the summer and autumn of European countries.

Small doses of sulphate of magnesia in bitter infusions are valuable in the treatment of dyspepsia accompanied with constipation. Many of the saline mineral waters resorted to for the cure of indigestion are chiefly indebted to the sulphate of magnesia for their purgative properties.

Sulphate of magnesia is a convenient antidote in cases of poisoning by the salts of lead or baryta.

Magnesian limestone is sometimes employed for building, and is a very durable stone: it is however one of the most deleterious stones for masons to hew, as the gritty particles very speedily occasion disorders of the lungs, followed by early death. The mouth and nostrils of the workmen should therefore always be defended by wearing a gauze mask.

MAGNESIAN LIMESTONE, in English geology, a 'formation' of the pœcilitic or new red-sandstone system; also the name of a group of limestone beds, which constitute the principal part of that formation, and generally contain a notable quantity of magnesia in their composition. Details regarding the formation will be more usefully combined in the account of the system of which it constitutes the base. We shall here confine ourselves to a notice of the limestone. This rock is seen to greatest perfection in England between the rivers Tyne and Tees, between the rivers Wharf and Dun, and between this last river and Nottingham. We mention these parts of the great line of magnesian limestone in the north of England for the purpose of pointing out some interesting differences in the composition and other characters of the rock. It is in the middle part of the course here indicated, from north to south, that the stratification of the rock is most developed. Between the Dun and Wharf, and for some space north and south of these rivers, this limestone occurs, in fact, in two rocks separated from each other by beds of red and bluish clay, with gypsum (indistinguishable from some of the upper or Keuper marls of the red-sandstone formation), but in the northern and southern parts this difference does not obtain. Of the two limestones thus separated, the upper one has but a limited extent (see Mr. Smith's 'Geological Map of Yorkshire'), the lower one is almost uninterrupted from beyond the Tyne nearly to the Trent. The upper rock is about 12 yards thick; the lower one reaches 50, or perhaps in some cases 100 yards; the upper one contains almost no magnesia, and lime burnt from it is extensively employed in agriculture; the lower one is very often composed of atomic aggregations of carbonate of lime and carbonate of magnesia, and, both as stone and when burnt to lime, is more useful in building. Its mode of aggregation varies extremely. In many situations (Thorp Arch, in Yorkshire) it is a soft powdery stone traversed nevertheless by veins of calcareous spar; about Tadcaster, and generally between the Nid and the Dun, it is a firm though hardly compact rock, often traversed by sparry veins and full of irregular crystallized cavities. The crystals are generally carbonate of lime, sometimes mixed with oxide of iron. In a few cases sulphate of barytes appears in the form of veins dividing this rock, as at Huddleston, near Ferrybridge, &c. Still less commonly thin veins of carbonate of copper (sometimes apparently epigene, on sulphuret) line the joints of the rock, about Newton Kyme, near Tadcaster, and in other places.

Some of the best building-stone of this description is dug in the quarries of Huddleston, Broadsworth, and Warmsworth, and it is generally really or nearly an atomic combination of carbonate of lime and carbonate of magnesia. (This fact was communicated to us by the late Dr. Henry of Manchester.)

A further state of arrangement of the materials of this rock is noticed in several localities between the Aire and the Dun, where the rocks assume locally and for limited areas the oolitic texture; and, finally, as one of the most valuable building-stones in the range of the magnesian limestone, may be signalized the white limestone of Roche Abbey, which in that noble ruin has stood the ravages of time better than almost any 'freestone' of the north of England.

Farther south, the grain of the rock changes; it becomes continually more and more crystalline, and from Bolsover to Nottingham the magnesian limestone may be described, with little inaccuracy, as a real dolomite, partially debased by small admixtures of sand. The small rhomboidal crystals of this rock are very evident in specimens which we collected many years ago at Mansfield Woodhouse and near Nottingham.

A crystalline structure of the magnesian limestone rock is however not confined to the southern portion of its range, though there it is manifested in connexion with very useful qualities in architecture. In the county of Durham we find it exhibited in the purely calcareous rocks of Hawthorn Hive near Easington, in the romantic, contorted, and broken cliffs and pinnacles of Marsden, and in the singular coralloidal quarries of Building-hill. At Marsden it is curious to notice in near contrast, in the cliff, the flexible laminated limestone, and in the detached pinnacles an equally laminated rock traversed by complete planes of crystalline structure. What does this teach? obviously, the important fact, that, since its deposition in laminæ, the sedimentary mass of carbonate of lime has been subject to a new molecular arrangement, which, predominating over the original structure, has readjusted the particles and generated a new structure. In the same vicinity are brecciated rocks, which seem to require the hypothesis of reaggregation of fragmented portions of previously indurated magnesian limestone beds. Thus various are the aspects of the mineral aggregation of the magnesian limestone of England. These diversities belong almost exclusively to the lower rock, for the upper laminated non-magnesian portion is usually of a uniform close texture, except in the lower beds, which are somewhat cellular (and of little value to the limeburner) at Knottingley.

It should be added that the general colour of the magnesian limestone (lower portion) is white, yellow, rich pale brown, or reddish, while the upper rock is commonly of a grey, smoky, or purplish hue. This rock is usually interstratified with thin clay partings, the lower one very rarely.

The specific gravity of magnesian limestone is usually greater than that of common carbonate of lime. This however may be overlooked in the usual incomplete mode of trying such experiments, unless the observer makes the easy correction due to the absorption of water by many of these stones. Tried in powder (for example, by Leslie's process), the magnesian limestones of England betray, by their weight, their affinity to the dolomitic rocks of the Alps and the Eifel, though the introduction of the magnesia is probably not at all due to the same cause in the two cases.

Professor Sedgwick, in his admirable memoir in the 'Geological Transactions,' on the Magnesian Limestone, has pointed out clearly the most common organic fossils of this rock. We shall only observe here that in respect of fishes (Palæonisci, &c.), mollusca (Producta, Spirifera, &c.), and zoophyta (Retepora, &c.), this rock shows an extreme analogy with the carboniferous system. Its place, by mineral analogies, may be rightly fixed in the pœcilitic system; but, by the affinities of organic existence, it will be classed with the more antient rocks. Let any one, for example, contrast its marine fossils, whether derived from Durham, Yorkshire, or the Thuringerwald, with those of the muschelkalk; the former are seen to be analogous to forms common in the mountain limestone, the latter to those of the lias. In neither case is the resemblance perfect; the species are not identical, but the result above announced is unequivocal, and must soon be felt in geological classification.

(Sedgwick in *Geol. Trans.*; Smith's *Geological Map of Yorkshire*, &c. Notices of contemporaneous deposits in the midland and southern counties of England occur in Murchison's *Silurian System*; Conybeare and Phillips, *Geol. of England and Wales*, &c.)

MAGNE'SIUM, a peculiar metal, of which magnesia is the oxide, a substance that was originally sold under this name by a Roman canon in the beginning of the eighteenth century. It is stated to have been first procured by calcining the residue left after evaporating the mother-waters of nitre. The method by which it is at present obtained will be presently stated.

The existence of magnesium was first demonstrated by the electro-chemical researches of Sir H. Davy: he found that when moistened magnesia was negatively electrized with mercury, an amalgam was obtained which decomposed water and gave rise to magnesia, by the oxidizement of the peculiar metal amalgamated with the mercury; he did not however obtain a sufficient quantity to enable him to examine its properties. In 1830 M. Bussy procured this metal by decomposing chloride of magnesium by means of potassium. This was effected by placing some small pieces of potassium in a glass tube, with fragments of the chloride put over them; this was fused by the application of heat, and the potassium was allowed to run through it by slightly inclining the tube; light was evolved, and the mass, when cold, was washed with water, which dissolved the chloride of potassium formed, and left the magnesium unacted upon in the state of small globules.

Magnesium is of a white colour, like silver; its lustre is metallic and brilliant, it is very malleable, and fuses at a red heat; in dry air it undergoes no change, but in moist air it is superficially oxidized; it may be boiled in water without suffering any change. When heated to redness in the air or in oxygen gas it burns brilliantly, and, combining with oxygen, becomes magnesia. In chlorine gas it burns spontaneously. It dissolves in diluted sulphuric and hydrochloric acids, with the evolution of hydrogen gas, and it is oxidized and dissolved by dilute nitric acid, and nitrate of magnesia results.

Oxygen and Magnesium, from what has just been stated, combine very readily, but only in one proportion; and the result is oxide of magnesium, or magnesia. The mode in which this substance was first obtained has already been mentioned. It is now procured by decomposing sulphate of magnesia by means of carbonate of soda, and subjecting the washed and dried carbonate precipitated to a strong heat in an earthen crucible: by this the carbonic acid is expelled, and the magnesia, or oxide of magnesium, remains, which has the following properties: it is colourless, inodorous, and tasteless, if pure; it does not, like lime, become hot when mixed with water, and it is very nearly insoluble in it, although when moistened it exhibits the alkaline property of turning vegetable yellows brown; by exposure to the air it attracts carbonic acid, and is reconverted to the state of carbonate, combined with some hydrate. It appears, from indirect experiments, to be composed of

1 equivalent of Magnesium .	12
1 equivalent of Oxygen . .	8
	—
Equivalent	20

Chlorine and Magnesium act readily upon each other, the metal burning spontaneously in the gas; it may also be procured by transmitting dry chlorine gas over a mixture of magnesia and charcoal, heated to redness in a porcelain tube. According however to Liebig it is best obtained by dissolving magnesia in hydrochloric acid, evaporating the solution to dryness, mixing the residue with an equal weight of hydrochlorate of ammonia, and projecting the mixture in small portions at a time into a red-hot platina crucible. When the ammoniacal salt has been expelled, fused chloride of magnesium remains, which on cooling becomes a transparent colourless mass; it is inodorous, intensely bitter, very deliquescent, and soluble both in water and alcohol. This salt is one of the saline ingredients of sea-water, and exists in the bittern left after preparing common salt, mixed with sulphate of magnesia. It is also found in some mineral waters, and was formerly called muriate of magnesia.

When a solution of chloride of magnesium is concentrated by evaporation, and exposed to a very cold atmosphere, it yields deliquescent prismatic crystals which contain much water.

It is applied to no direct use; sometimes however the bittern which contains it is decomposed by an alkaline carbonate, for the purpose of forming carbonate of magnesia. It consists of

1 equivalent of Magnesium .	12
1 equivalent of Chlorine . .	36
	—
Equivalent	48

Bromine and Magnesium may be obtained in combination by dissolving magnesia in hydrobromic acid; by evaporation small acicular prisms of bromide crystallize, which have a sharp taste, are very deliquescent, and soluble both in water and alcohol. When heated in the air these crystals are resolved into hydrobromic acid and magnesia.

Fluorine and Magnesium unite when magnesia is dissolved in hydrofluoric acid. The compound formed is insoluble in water, or in hydrofluoric acid, and is not decomposed by a red heat.

Carbon and Magnesium.—No compound of these is known.

Sulphur and Magnesium do not combine when heated together, nor is a perfect sulphuret formed when sulphur is heated with magnesia. The compound is not soluble in water; by heat the sulphur burns off. When however a solution of sulphuret of barium is added to one of sulphate of magnesia, then, according to Berzelius, sulphate of barytes is precipitated, and sulphuret of barium remains in solution.

Iodine and Magnesium.—A compound of these is obtained when magnesia is dissolved in hydriodic acid; it is very soluble in water, and known only in solution. It is stated also that when magnesia is heated with iodine in water, both iodide of magnesium and iodate of magnesia are procured.

Magnesia, or *Oxide of Magnesium*, combines with most acids to form salts, two of which are of great importance in medicine; but we shall first mention the

Hydrate of Magnesia.—This is a saline compound, and was first discovered in serpentine in New Jersey, and since in Unst. It is white, with a greenish tint, foliated, and easily splits into thin flexible laminæ. It has a pearly lustre, translucent on the edges. Specific gravity 2·35; hardness 1. It is stated to occur at Hoboken, in New Jersey, in diverging needleform crystals. It is composed of about 31 water and 68 magnesia, with a little oxide of iron and manganese; these are nearly in the proportion of one equivalent each of water and earth.

Hydrate of magnesia may be obtained artificially by precipitating a solution of the sulphate with soda. The precipitate, after drying at 212°, retains about one-fourth of its weight of water.

Nitric Acid and Magnesia readily combine, and yield nitrate of magnesia. The solution is colourless, and extremely bitter. By evaporation it yields, though with difficulty, rhombic crystals, which contain a large quantity of water, and are very deliquescent. It is decomposed at a red heat, and is sometimes found in crude nitre. The anhydrous salt is composed of

1 equivalent of Nitric Acid	54
1 equivalent of Magnesia	20
Equivalent	74

It is now applied to no use, but is the salt from which magnesia was originally obtained.

Carbonic Acid and Magnesia form carbonate of magnesia, and it has been found native in New Jersey. It has a yellowish white colour, with a flat conchoidal and sometimes earthy fracture. It is opaque, hardness 4·5, and very difficult to break. Specific gravity about 2·8 to 2·9. The purest was found by Klaproth to consist of carbonic acid 49, and magnesia 48, with 3 of water. It may therefore be considered as composed of very nearly one equivalent of acid and one of base.

Carbonate of magnesia, or rather a compound of carbonate and hydrate of magnesia, is artificially prepared for medicinal use by decomposing the sulphate of magnesia by means of carbonate of soda. The carbonate of magnesia is precipitated as an insoluble white powder. This substance, when pure, is colourless, inodorous, tasteless, and unalterable in the air; it is decomposed by the stronger acids with effervescence, and by heat the carbonic acid is also expelled. It appears to be composed of

4 equivalents of hydrated carbonate of Magnesia	204
1 equivalent of bihydrated Magnesia	38
Equivalent	242

Sulphuric Acid and Magnesia constitute the salt long and well known by the name of Epsom salt, having been first obtained from a spring at that place. Sulphate of magnesia, which is its proper name, was afterwards obtained by evaporating and crystallizing the bittern remaining after preparing common salt from sea-water; but it was mixed with so much chloride of magnesium that it was extremely liable to become damp. The late Dr. Henry invented a very ingenious process for preparing it from magnesian limestone, in which this inconvenience and impurity are totally avoided.

Sulphate of magnesia is a salt which crystallizes very readily; and although the crystals are usually small, they may be obtained of considerable size by slowly cooling a large quantity of the solution. The primary form of the crystal is a right prism, with a rhombic base. This salt is extremely bitter, readily soluble in cold water, which dissolves an equal weight, and boiling water one-third more. It is but slightly altered by exposure to the air, yet is rather inclined to effloresce. It is not decomposed by heat, but the water of crystallization is expelled. It is composed of

1 equivalent of Sulphuric Acid	40
1 equivalent of Magnesia	20
7 equivalents of Water	63
Equivalent	123

It is extensively employed as a purgative, and for the preparation of magnesia and its carbonate.

This salt combines with various others to form double salts: as, for example, with sulphate of ammonia, of potash, and of soda, forming the ammonio sulphate, the potash and soda sulphates of magnesia, which are all crystalline salts, but they are not important.

Phosphoric Acid and Magnesia are best obtained in combination by mixing concentrated and hot solutions of sulphate of magnesia and phosphate of soda after some hours crystals of the phosphate are obtained. They effloresce slowly in the air, and are soluble in fifteen times their weight of cold water, and by hot water they are decomposed into a subsalt which is insoluble, and an acid one which remains in solution. The crystals are composed of

1 equivalent of Phosphoric Acid	36
1 equivalent of Magnesia	20
7 equivalents of Water	63
Equivalent	119

This salt is applied to no use; combined with ammonia it forms the ammoniaco-magnesian phosphate, a compound which exists in urine, and is a common ingredient in urinary calculi. [Calculus.]

Magnesia forms a great number of double salts, and one of these, the magnesian limestone, which is a double carbonate of lime and magnesia, is found in immense quantities in different parts of England. [Magnesian Limestone.] Magnesia is found also in a great number of mineral bodies: as steatite, talc, asbestos, &c.

Magnesian salts are mostly soluble in water; by the addition of soda they yield hydrate of magnesia, and by adding carbonate of soda, hydrated carbonate of magnesia.

The sesqui- and bi-carbonates of potash and soda occasion no precipitation in solutions of magnesian salts, until heated so as to repel the excess of carbonic acid. Phosphate of soda added to magnesian solution gives no immediate precipitate, but on the addition of ammonia an extremely insoluble ammoniaco-magnesian phosphate is formed; and this is the best mode of testing the presence of magnesia, when the requisite precautions are adopted.

MAGNET (derived from the Greek *μάγνης*) is a metallic body possessing the remarkable property of attracting iron and some other metals. It is said to have been found abundantly near Magnesia in Lydia, from which circumstance its name may have been derived. The attracting power of the magnet was known at a very early period, as references are made to it by Aristotle, and more particularly by Pliny, who states that ignorant people called it *ferrum vivum*, or quick-iron; a name somewhat analogous to our load-stone. The same author appears to have been acquainted with the power of the magnet to communicate properties similar to its own to other bodies. When found native, it is generally a heavy ferruginous ore of a dull greyish colour, but the ores of cobalt and nickel also frequently possess the magnetic properties.

The universal law, that reaction is coexistent with action, implies, that iron must react on the magnet, and we find in fact, that if a piece of iron is fixed, and a small magnet be suspended by a string near it, the magnet will then be moved towards the iron; thus all the iron in the mass of the globe acts upon a magnet. It is also now known that electrical currents influence magnetic bodies [Electro-Magnetism]; while heat has an influence on magnetic intensity. Hence it follows as a mechanical consequence, that if a magnetic needle or cylinder be suspended by its centre of gravity, so as to be free to move in any direction round that point, it will not take an arbitrary position like unmagnetized bodies, but must take a specific direction, namely, that which represents the resultant of all the magnetic forces to which it is subject. Its position in a given place can be defined by two angles; the one called the *variation* or declination, the other the *dip*. The first is the angle formed by the vertical plane in which the needle lies with the plane of the meridian; the second is the inclination of the line of the needle to the plane of the horizon. The latter is avoided in the compass-needle by sustaining it horizontally on a point which is necessarily different from its centre of gravity, and the variation is then the angle made by the direction of the needle with that of an exact and horizontal north-and-south line. This property of the needle is called its polarity, and is a consequence of its other properties above noticed; the fact however escaped the notice of the Greeks and Romans of antiquity, but the Chinese appear to have been acquainted with it from a very remote date. It is the most useful of the known properties of the magnet, being of the most essential importance to the mariner, when the magnet is constructed in the form of the compass-needle.

Dr. Gilbert, who was physician in ordinary to Queen Elizabeth, states that P. Venetus brought a compass from China in 1260. Gilbert bestowed much attention on the subject of magnetism, and to some extent inculcated the doctrine of gravitation, by comparing the earth to a great magnet. His theory on this subject is given in a work entitled *Tractatus sive Physiologia nova de Magnete* (1600), and the term 'poles of a magnet' arose from that theory, which is remarkably consonant with the notions of the present day; for the north pole of the magnet he denominated the south pole, in connection with his theory, while Poisson, in his elegant 'Memoirs on Magnetism,' calls the magnetic fluid at that extremity of the magnet the *Austral Fluid*, because, as like electricities repel [Electricity], so, on his hypothesis of the magnetic fluids, that occupying the north end of a magnetized needle is repelled by the austral fluid of terrestrial magnetism.

The application of the compass to the purposes of navigation must speedily have led to the discovery of its variation, and in the 'Life of Columbus,' written by his son, it is distinctly assigned to that celebrated man; and though its amount in 1492 must have been small in France, Spain, &c., yet it was doubtless a very observable quantity in many of the regions visited by Columbus. Some have carried back the date of this discovery to the year 1269, but on very doubtful grounds. When its amount came to be observed with some accuracy, we find it at Paris, in 1541, 7½° E.; in 1550, 8½° E.; in 1580, 11½° E.; in 1630, 4½° E.; and at Rome, in 1670, 2° W. At the present moment it has passed its maximum in London, and is now moving easterly.

It is not improbable that Columbus was acquainted also with the diurnal variation, but nothing very accurate on this subject was known before the numerous and valuable observations made by Canton, in 1750. He showed that he needle vibrates, during the day and the night, through an arc as great as 13½′ in the midsummer, the minimum 7′ occurring in the winter season; he ascribed the diurnal variation to the action of solar heat affecting the intensity f the magnetism of the earth. The principles of thermo-electric currents were at that period unknown, but Hooke n 1684 showed that iron and steel rods could be magnetised, by rapidly heating and cooling them in the magnetic meridian. Graham, instrument-maker, of London, was the he first who distinctly announced the diurnal variation, in 772; the maximum declination being then 14° 35′ west. he variation of the variation was first observed by Gunter.

The *dip* was first observed by Robert Norman in 1576. His mode of adjusting the compass-needle led him to this iscovery; for he accurately balanced the needle on its ivot, previous to magnetizing it. After it became a magnet, it would no longer balance on the same point, without attaching a small weight at the south extremity. When freely suspended by the centre of gravity, the north xtremity became depressed; the dip then being about 71° 0′. The dip undergoes diurnal variations, as well as the eclination; but observations on the former are far the most difficult. The dip also changes by elevating the eedle to considerable heights; on which subject Biot has made some very delicate experiments. A very simple law elative to the amount of the dip at different parts of the arth's surface was remarked by professor Krafft, of St. Petersburg, in 1809; namely, if we measure the latitude from he magnetic equator, the tangent of the dip is double the angent of such latitude. Mr. Barlow has illustrated this aw by experiments on magnetized iron *balls* acting on mall needles at the surfaces; and Biot has deduced the ame law from theory.

The law of the magnetic forces was a long time undiscovered: Newton supposed it to follow the inverse cube of he distance, or some higher power; for in his experiments, he variation of intensity and the effect of the mutual influences of the magnetic fluids in the bodies themselves being verlooked, an erroneous result was necessarily consequent. However, Mitchell, by a careful revision of the experiments f Dr. Brooke Taylor and of Hauksbee; Coulomb, by his legant apparatus, the torsion balance; Biot, by the method of observing the times of the oscillations of the mall needles acted on; and finally, Hansteen of Christiana, by a series of refined experiments and calculations, have demonstrated the true law of magnetic action; namely, directly as the intensity, and inversely as the quare of the distance.

One essential property by which a magnet differs from oft iron under the magnetic influence, is this: if we separate a magnetic bar into any number of minute parts, each uch part will be endowed with polarity, similar to the whole: the position of those poles, or foci of greatest attraction, is permanent in a magnet of a given form; but in soft ron it will change when the distance of the iron from the nfluencing magnet is altered.

Halley was sent out, under William and Mary, with the command of two ships, to make magnetic observations in different latitudes, both in the Atlantic and Pacific (in 1698-9); and was the first who constructed a magnetic chart, which possessed at the time great merit for accuracy: the most valued at the present day are those by Hansteen, constructed from observations subsequent to Halley, by various scientific travellers and nautical men, such as Humboldt, Ross, Parry, Scoresby, &c. [Magnetism.]

During a thunder-storm, the poles of a magnet are frequently inverted, the explanation of which belongs to Electro-Magnetism: and the appearance of the aurora borealis is often attended with vibrations of the compass-needle, to the extent of several degrees. The actual mode in which the aurora is produced being still unknown, it is impossible to decide whether the aurora is itself the cause of this magnetic phænomenon, or whether both are attributable to some unknown common cause.

MAGNETIC INTENSITY. When a magnetic needle is freely suspended by its centre of gravity, it is then acted on by all terrestrial bodies containing the magnetic fluids, whether in a fixed state, as in loadstone-ores, or in a state susceptible of change, as in masses of soft iron, and also by electrical currents, whether produced by the chemical changes which various substances in the globe continually undergo, or arising from the unequal distribution of heat both in the interior of the earth and on the surface in different latitudes. The direction of the resultant of all such forces may be regarded as possessing parallelism throughout the extent of the needle, and the latter acquires in consequence a like direction in the plane of the magnetic meridian, of which the position becomes in this manner known.

If a needle thus suspended be made to oscillate in the plane of the magnetic meridian, and the time in which a certain number of oscillations are performed be observed, and thus the time of a single oscillation deduced, the connection of this time with the intensity of the magnetic force is expressed by the formula $t = \pi \sqrt{\left(\frac{l}{F}\right)}$ similar to that used for the common pendulum. In this equation t represents the time of one oscillation, π the number 3·14159, l the distance between the centres of oscillation and gravity, and F the accelerating force of magnetism. Hence we deduce also $F = \frac{\pi^2 l}{t^2}$; consequently when one and the same needle is used in different experiments, the force F is inversely as the square of the time t of one or of a given number of oscillations. But it is in practice extremely difficult to produce oscillations in the magnetic meridian, and ingenious contrivances to that end have often been suggested and used, but the object of ascertaining the relative value of F is equally attained by supporting the needle horizontally, as in the compass, and observing the time of the horizontal oscillations. If θ represent the dip, then by the resolution of forces the horizontal part of the magnetic force is $F \cos\theta$; if now T represent the time of (suppose 300) oscillations, then by the preceding formula we must have $F \cos\theta$ inversely proportional to T^2; let F', θ', T', represent quantities corresponding to F, θ, T, for a different latitude or longitude, then $\frac{F}{F'} = \frac{T'^2 \cos\theta'}{T^2 \cos\theta}$; by which formula the relative intensities of terrestrial magnetism at different places may be ascertained with little trouble.

The times of 300 oscillations in seconds at the following places are taken from a table computed by Hansteen:— Stockholm 815, Edinburgh 820, Christiansand 820, Oxford 780, Danzig 770, Gottenburg 812, Liverpool 801, London 775, Berlin 760, Paris 753, Lübeck 776, Altona 776, Johnsknuden 861, Christiania 814, Ingolfsland 833, Copenhagen 788, Breslau 741.

The locus of all the points at which the intensity of terrestrial magnetism is the same quantity as at one given place is called the *isodynamic line* passing through it. These lines are generally of double curvative; but neglecting this, which may also be said of the lines of equal dip, they run generally parallel to each other and to the latter lines, in the temperate zone, but in other cases these two classes of lines intersect at a considerable angle. M. Hansteen states that the intensity of magnetism is less in the southern than in the northern hemisphere. M. Biot has given a formula deduced from hypothetical considerations, which has been found nearly coincident with the observed cases of terrestrial intensity, viz. intensity $\propto \frac{1}{\sqrt{(4-3\sin^2\theta)}}$; θ being the dip as before.

As the declination and dip have diurnal variations, so also has the magnetic intensity; the minimum being between ten and eleven in the morning, and the maximum in about six hours afterwards. The intensity is also greatest in December, and least in June.

An interesting series of observations made by M. Quetelet, of Brussels, shows that in the gradual ascent from Geneva to the Col de Balme the intensity of terrestrial magnetism increases; for instance, the horizontal intensity at the village Simplon is greater than that at Bonneville nearly in the ratio of 44 to 43.

Similar methods (and sometimes the balance of torsion) have been used to discover the relative intensities of magnetism as distributed in bodies; in straight and narrow laminæ it has been found by Coulomb to be nearly proportional to the square of the distance from the middle point.

MAGNETISM. If we take a natural or artificial magnet, and, spreading over a piece of paper a quantity of fine iron filings, place the magnet on the paper, on taking it up, we shall find that the iron filings are attached to it in some degree over all its surface, but they will be principally accumulated at two points situated near the ends of the magnet; these points are called the poles of the magnet. Sometimes when a magnetic bar is rolled amongst iron filings, we may find several such points along the bar; the magnet is then said to have consecutive points. At present we shall consider only the first or simple case of two poles, which we may represent by the letters N and S. When a needle formed of this material is suspended horizontally on a pivot armed with agate, it assumes a particular direction, nearly north and south. [Magnet.] The pole N, at the north extremity of the needle thus adjusted, is commonly called the north pole of the needle; the other, S, the south pole, though the contrary names, as used by Dr. Gilbert, would be more correct in connection with the theory of magnetism.

If we now bring a piece of soft iron near the pole N, it will be attracted to that pole and become attached to it, so that the exertion of a mechanical force is necessary to separate them. In this way a magnet held vertically will sustain a piece of iron, provided the weight of the iron does not exceed the magnetic force. The pole S has a similar attractive power on iron; the cause of this attractive power is called Magnetism.

We have observed that in a magnetic needle placed horizontally on a pivot, the pole N is turned northwards, and S southwards, nearly: if such a needle be attached to a piece of cork floating on water, it will adjust itself to this direction, the deviation of which from the true north-and-south line is the declination of the needle. If now we invert the position of the needle, so that S is brought into the place previously occupied by N, and *vice versâ*, the needle and cork will make a complete revolution, and acquire its original position. Hence we see a distinction between the magnetisms *predominant* at N and at S; the former is called *Austral*, and the latter *Boreal* magnetism. It will be easy to observe the analogy between the mutual relations of the two magnetisms, and those of positive with negative electricities.

We must insulate a conducting electrized substance in order to preserve its electricity, but this is not necessary in the case of a magnet; each fragment of the latter is itself a magnet, possessing its north and south poles, and the same view may be extended to its constituent particles. A nonconducting energy, called the *coercive power*, exists therefore in magnetic substances, by which the loss of magnetism when developed is prevented, and by which also the poles N and S are situate in a determinate position relative to the body of the magnet. This is not the case with soft iron, which has not the coercive force.

The force of magnetism is exerted without alteration through substances which are not magnetic; the same is true with respect to the electrical forces when nonconducting bodies are interposed in the direction of their action. On the other hand, the effect of the magnetic forces is considerably modified when substances which are capable of becoming magnetic by influence are situated near the magnet; and a similar effect takes place by the decomposition of the neutral electricities when under the influence of an electrized body. [Electricity.] The transmission of the magnetic force through interposed bodies may be observed familiarly by placing a common sewing-needle on a smooth horizontal board, and moving a strong magnet underneath the board: the needle will roll or revolve along the board according to the peculiar motions given to the magnet.

Let us next consider the action of magnets on each other. For this purpose make two magnets or magnetic needles to float on water, distinguishing the poles of one as before by N and S, and of the other by N′ and S′. Bring either the pole N near to N′, or S to S′: the needles or magnets will separate to a greater distance, and with the greater energy the nearer these poles are placed to each other. On the contrary, if we bring N and S′ near each other, the needles will approach and unite those points, and the same happens when the points N′ and S are made contiguous: hence this law—*magnetisms of the same name are mutually repulsive; those of contrary names are mutually attractive.* In the article Electricity, above referred to, we have shown that the same law is true with respect to the two electricities.

The mass of the globe contains various sources of magnetism [Magnet]; and since a magnetic needle freely suspended acquires a determinate position, it follows from this law that the magnetism at the south extremity S is Boreal, that is, of the same name as the terrestrial magnetism which is predominant in the northern hemisphere, being repelled therefrom; and the magnetism at the north extremity N is for a like reason Austral. The law of magnetic force at different distances is expressed by the inverse square of the distance: the best mode of verifying this law is by observing the times of the oscillations of a small fine wire, suspended in a plane perpendicular to the magnetic meridian (in order to neutralize the magnetizing influence of the earth), and subjected to the action of a powerful magnet.

We can, by combining these laws, explain the manner in which soft iron, cobalt, and nickel are attracted or suspended by a magnet. These metals, when unoxygenated, contain both the austral and boreal magnetism in a combined state, in consequence of their want of coercive power. When a piece of soft iron is brought near the pole N, which contains the austral fluid, the austral magnetism of the iron is repelled to the farther extremity, and the boreal attracted to the nearer extremity of the iron relative to the point N· this disposition of the fluid takes place immediately, and the law of force above announced relative to the distances causes the attraction of the fluid at N, on the boreal fluid of the soft iron, to exceed its repulsion on the austral, which is more remote from N: the total effect, in virtue of this excess, is therefore necessarily attractive. When the iron however is removed from this influence, its natural magnetisms again recombine. This will not be the case if, instead of soft iron, we use hardened iron or steel: the decomposition of the natural magnetisms takes place with greater difficulty, in consequence of the coercive power which protects their actual disposition; but if we use a powerful magnet at one extremity of a steel needle, or, which is more effectual, a pair of strong magnets at both extremities, the north pole of one and the south pole of the other being brought in contact with the needle, the decomposition will be partially effected, and will likewise be retained by the same coercive power which opposed its development; and agreeably with the magnetic laws of repulsion and attraction, that point of the needle in contact with the south pole will become a north pole of the needle, and the other a south pole. This method of producing magnetism is liable to the objections both of producing feeble magnetism and also producing consecutive points.

The quantities of the austral and boreal magnetic fluids in all magnetic bodies are equal; for when we bestow magnetic qualities on iron or steel by the influence of loadstones, hammering, sudden cooling in the magnetic meridian, &c., no new magnetism is communicated; but the natural magnetisms, which previously neutralized each other, are now decomposed. Again, if a magnetic needle be freely suspended by its centre of gravity, the action of terrestrial magnetism produces no linear motion, but only imposes a direction on the magnetic axis: now all the boreal fluid in the globe attracts all the austral fluid of the needle, and *vice versâ*, while the like fluids in both repel: hence a motion of progression would be generated, unless the resultant of the repulsive forces on the needle was exactly equal and of an opposite direction to the resultant of all the attractive forces; and the rotatory motio[illegible]f the needle shows that the points of application of these forces are different; but the intensity of terrestrial magnetism may be regarded as uniform throughout the extent of the needle, and its direction parallel. In order therefore that the resultants should be equal and contrary, the sums of the boreal and austral forces of the needle must be equal. In this respect magnetism resembles the natural electricities of all substances.

The development of magnetism in bodies, whether by terrestrial action or the influence of loadstones, is analogous to the decomposition of the natural electricities in a system of conducting bodies separated by non-conductors under the influence of an external body and their own natural action: hence when magnetism is communicated by a loadstone, even when in contact the latter loses none of its own magnetism, as it acts solely by influence; whereas in conducting electrized bodies, contact will communicate electricity: the coercive force of magnets therefore extends even to their surfaces. In fact the reaction of the substance magnetized by influence tends to a further decomposition of the fluids of the magnetizing body, and this gives it greater energy, unless when it is magnetized to saturation, that is, when the internal magnetic forces are equal to the coercive power; for then any further development of the fluids would be only temporary, and a reunion would take place immediately.

The dipping-needle is a magnetic needle, the opposite poles of which possess equal magnetic intensities. It is attached to the centre of a vertical circle, and its motion is confined to the plane of this circle. The circle has a motion in azimuth about a vertical axis, and within a fixed horizontal circle, both circles being graduated. When the vertical circle is turned round its axis until the needle acquires a vertical position, the plane of the circle is then perpendicular to that of the magnetic meridian, and hence by means of the horizontal circle the position of this meridian plane becomes known. The vertical circle with the needle is now brought to coincide with the meridian plane, and the angular depression of the north pole of the horizon, or more strictly of the magnetic axis, may be read off the graduated limb of the vertical circle, and measures the dip. The right line joining the north and south poles of the needle is nearly coincident with the magnetic axis, but the latter may be ascertained more accurately by inverting the needle and taking the mean direction between its two positions of equilibrium. There are other methods of adjusting the dipping-needle, but in every method it requires great delicacy and minute attention to all parts of the adjustment.

If we place a bar of soft iron, suspended by a collection of silk strings at its middle, in a direction parallel to the magnetic axis of the dipping-needle, the action of terrestrial magnetism will have full effect on the bar, its natural magnetisms will be decomposed, and it will acquire a polarity similar to that of the needle, its poles repelling the similar poles of the needle, and attracting the contrary poles. Its want of coercive power prevents it from retaining the polarity of its different parts when the bar is moved into other positions; for if we invert the position of the bar, that point which was primitively the north pole will now become the south, and *vice versâ*, under the effects of a new decomposition of its magnetisms by terrestrial influence. If however the bar be left for a long time in the direction of the magnetic axis, so as to acquire some oxygenation, or if it be heated to a red heat and suddenly cooled by immersion in water, it will acquire a coercive force, and become permanently magnetic. Iron crosses, weathercocks, &c., which have been long kept in a fixed position, or have been struck by lightning, acquire magnetic properties in the manner above described.

It is a remarkable circumstance connected with the change of molecular disposition caused by the action of heat, that if we gradually heat a bar of iron, the intensity of its action on a magnet increases, and arrives at a maximum when the bar is brought to a cherry-red heat; with higher degrees of heat the intensity is diminished, and is totally inappreciable when the bar has reached a bright white heat; on cooling it recovers its powers of action by similar steps, and the same law holds true if the magnet be heated instead of the bar. Hence in producing the greatest development of magnetism by influence, we see the advantage of using iron or steel bars at a red heat.

Magnetism may be developed in iron, steel, cobalt, and nickel, by other means than the influence of bodies already magnetized, as twisting, hammering, electrical discharges, and galvanic currents. [ELECTRO-MAGNETISM.] If we place a bar of iron in a vertical position, and give it a series of slight blows with a hammer or poker, it will acquire a feeble degree of magnetism; hence it happens that the anvils and other tools employed in smithies are endowed with magnetism. In all such cases the mechanical operations tend to bestow a coercive power, while the terrestrial magnetism separates the fluids in the body.

Cavallo, Benett, and Coulomb remarked the indications of magnetism given by various substances, as copper, silver, &c. It is particularly observable in hammered copper, and scarcely perceptible when the copper has been cast, an attention to which circumstance is of considerable importance in shipbuilding. Coulomb formed very fine needles of various substances, and suspending them by silk strings between the opposite poles of two powerful loadstones, found that they were acted on by the latter. This phenomenon is attributable to the existence of minute quantities of iron, or iron compounds in those different bodies. The intensity of the magnetic action Coulomb found from direct experiments to be proportional to the quantities of iron contained in the bodies, and he afterwards applied this principle to discover the quantity of iron contained in impure metals.

From the preceding observations on the properties of the magnetic fluids it will be easy to understand the principles upon which the various modes of constructing artificial fluids are founded, which we shall now briefly notice. The earliest method of magnetizing a bar of hard iron or steel was by drawing it throughout its whole extent at right angles over one of the poles of a strong magnet. In this case if we suppose that pole which contains the austral fluid to be used, the first contact with the bar decomposes its neutral magnetisms, attracting to the point of contact the boreal and repelling the austral; the successive parts of the bar are subject to a similar decomposition of their fluids, but it is evident that the effect of each previous decomposition neutralizes the succeeding, except at the extremities; the magnetism thus developed is therefore feeble, and apparent only at the extremities of the bars, or in some consecutive points formed by peculiarities in the material of the bar, or in the mode of operation. Dr. G. Knight greatly improved the mode of magnetizing bars in the following manner: he joined two strongly magnetized bars by their ends bearing contrary names, and placing on them in the direction of their length a small steel bar heated to a cherry-red heat, with its middle on the point of junction of the magnetic bars, he made each of them to rub on the corresponding extremity of this steel bar, and the latter when removed was found to be strongly magnetized. In this method not only does the presence of the second magnet favour the decomposition of the magnetic fluids, but the intensity of the action of the magnetic forces is greatly increased by the elevated temperature of the steel bar.

Du Hamel placed two steel bars of equal length parallel to each other, connecting their corresponding extremities by pieces of soft iron interposed: then taking two bundles of magnetic bars, he united their poles of contrary name near the middle of one of the steel bars, and by inclining the bundles made one of them pass towards one extremity of the other bar, the second passing in the contrary direction, and then successively repeated the operation, when both the steel bars became strongly magnetized, but with contrary magnetisms at the corresponding extremities of each. In this method the decomposition of the neutral magnetisms of the interposed pieces of soft iron adds to the effect produced by the contact of the magnetized bundles with the steel bars.

Epinus, adopting a similar method, preferred interposing strong magnets instead of soft iron, the relative position of the poles of the two magnets being reversed; Coulomb combined the advantages of these different methods by composing his magnetized bundles of bars at a cherry-red heat. A fine steel needle may be very strongly magnetized by being placed in the axis of a wire twisted into the form of a helix, the extremities of which are brought in contact with the wires of a powerful galvanic battery. The poles of a bar magnetized to saturation are near its extremities, within generally a few lines, while the intensity becomes insensible at the distance of a few inches; in a thin bar the intensity may be represented by the difference of the ordinates of two logarithmic curves, the origin of one being at the austral, and of the others at the boreal extremity of the needle.

When bodies containing neutral magnetisms are made to rotate rapidly round an axis, the magnetism becomes developed and acts on the needle; thus a plate of copper made to revolve rapidly in a horizontal plane will influence a compass-needle placed over it, and produce in it a rotation in the same direction, on which subject several valuable observations have been made by M. Arago, Sir John Herschel, &c. It has also produced a second mathematical memoir from M. Poisson, in which the mechanical force generated by rotation is introduced into the general equations deduced from his theory of the distribution of magnetism in bodies.

The consideration of the distribution of magnetism throughout the globe has led to various explanatory hypotheses since the time of Halley; the position, the number, and the motions of the points which may be regarded as poles of terrestrial magnetism, have been all subjects of discussion and of opinions formed on inconclusive grounds. The excellent tables and maps of Hansteen have given a greater degree of certainty to this subject. The French government having lately sent out an expedition for geographical and scientific discovery, the report of which may be shortly expected; and the British government having appointed Captain James Ross with a view to similar objects in the Pacific, we shall defer to the article TERRESTRIAL MAGNETISM an account of the dip, variation, and intensity, at different parts of the earth, as well as the consideration of the magnetic equator and poles.

Magnetic observations are now generally made in Europe in observatories, and also by scientific travellers; and something valuable on the subject of terrestrial magnetism is daily added to our previous knowledge.

For the theory of magnetism as connected with electricity consult Robison's *Course of Lectures;* Biot's *Physique;* Becquerel, *Traité de l'Electricité;* and Captain Kater's Papers in the *Phil. Trans.*

For the mathematical theory on this subject—the *Memoirs*, by Poisson; Ampere's *Electro-Dynamic Treatise;* and Murphy's *Electricity*, chap. vii., Cambridge.

With respect to the construction of artificial magnets—Brooke Taylor, *Phil. Trans.*, 1714-25; Michell *On Artificial Magnets*, London, 1750; Cavallo *On Magnetism*, London, 1786; Brewster, in *Encyclopædia Britannica*, last ed.; Barlow, in *Encyclopædia Metrop.;* and Scoresby *On Magnets*, 1839, &c.

MAGNETISM, ANIMAL. [ANIMAL MAGNETISM.]

MAGNIFYING POWER. [MICROSCOPE; TELESCOPE.]

MAGNITUDE. This term is generally used synonymously with quantity, and is sometimes even confounded with number. The distinction between the first two terms is not more marked than this:—he who answers the question 'how much?' describes the quantity, and he who answers 'how great?' describes the magnitude. But since magnitude is generally used in our language as applied to amount of space, we may best describe our own idiom by laying down quantity as the general term, and stating magnitude to mean usually the quantity of space. The term however must be considered, in a mathematical point of view, as originating with Euclid (whose word is μέγεθος), and it is used by him, not particularly as applied to space, but also to everything which admits of the introduction of the notion of greater or less. In this sense then, we have many magnitudes (all moral qualities for instance) which are not the object of mathematical reasoning. So necessary is the notion of magnitude to our conception even of things which we cannot measure, that we borrow idioms from subjects within the province of mathematics. Thus we speak of force of mind, and of it being greater in one individual than in another. According to the definition of magnitude, namely, 'that of which greater or less can be predicated, when two of the same kind are compared together,' it follows that we include both mental as well as material objects of conception. But the mathematics interpose the postulate that no such object can be made matter of exact reasoning, unless in cases which admit of the comparison being performed according to some method the results of which shall be self-evident, and inseparable from our notion of the thing measured. Let A and B be two magnitudes of the same kind; they are then, and then only, the objects of mathematical comparison, when other magnitudes equal to A and B can be found, and added together as often as may be desired; and when, moreover, any collection of As can be compared with a collection of Bs, so as to ascertain which is greater or less than the other. Angles furnish an instance of magnitude the conception of which is exceedingly vague in the mind of most beginners, but which takes precision and certainty in the course of mathematical study. Magnitudes, thus capable of comparison, are the objects of the doctrine of PROPORTION. [See also NUMBER; QUANTITY.] That part of geometry which precedes proportion considers only the simple alternative of equal or unequal, modes of inequality being necessarily deferred until after that consideration.

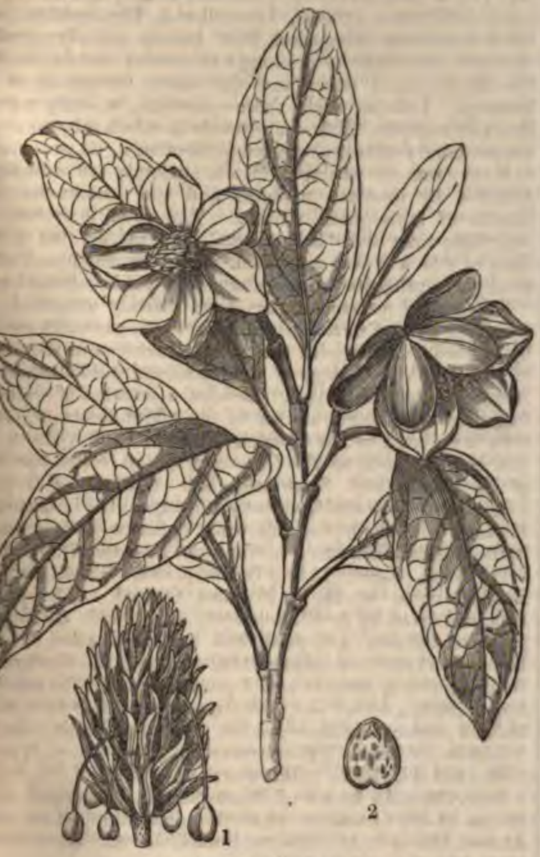
By the magnitude of any bounded space the mathematician means the results of measurement which will be described in SOLID, &c. DIMENSIONS: but the common idiom refers to that which the mathematician calls for distinction *apparent* magnitude. It is correct, in the common meaning of the term, to say, that a man at a little distance from the eye is larger than a remote mountain. In thus judging of objects, the angles which they subtend at the eye furnish the means of comparison. Experience, derived from the combination of sight and touch, teaches us how to make those deductions which are necessary before we can learn the absolute from the apparent magnitude.

It is soon found that an object, as it recedes, grows smaller, that is, subtends a less angle. It is also seen that the recess is accompanied by a loss of brightness and distinctness. The former is a consequence of the loss of light which takes place in its passage through the air; were it not for this, the same object would be equally bright at all distances; for though the quantity of light which enters the eye is diminished by increase of distance, yet the surface from which the light appears to proceed is diminished in the same proportion. The loss of distinctness is a consequence, first of the loss of light, next of the different proportion in which different colours are lost: the effect of the interposed atmosphere amounting to laying on more or less of the blue colour of the atmosphere over the whole. Our perception of magnitude depends both on the subtended angle and on the distinctness: we learn from experience, that of two objects seen under the same angle, the less distinct, as being the more distant, must be the larger. That habit is our guide can readily be shown by producing instances in which we are deceived, the object being either such as is not commonly seen, or seen under unusual circumstances. A colossal statue mounted on a column does not suggest the idea of a man of unusual size to persons in general, unless when some person mounts the same height, and affords means of comparison. In a fog, which diminishes the distinctness of objects, but does not affect the angles under which they are seen, these objects are sensibly increased in apparent size; and distant hills appear nearer in a clear day than in a hazy one. Those who wear spectacles may satisfy themselves, by breathing on the glasses, and watching an object as the moisture evaporates, that increase of distinctness gives apparent approximation.

The angle subtended by an object is inversely as its distance, which is sufficiently near for common purposes, when angles are small, which is generally the case. And a man of six feet high, at the distance of a hundred feet, is seen under an angle of 3° 26′. The sun is seen under an angle of 32′, and the moon under an angle of 29½′ to 33½′.

MAGNOLIA'CEÆ, an important natural order of albuminous polypetalous Exogens, consisting of bushes and trees, inhabiting the temperate parts of both the Old and New World. They have the numerous disjoined carpels and hypogynous stamens of Ranunculaceæ, to which they are closely allied; they differ not only in their arborescent habit, but in the young leaves being enveloped in stipules, either horn-like and convolute, or bivalved, which are thrown off as the leaves unfold. The flowers are usually large and sweet-scented, and the leaves are firm, broad, and large, in consequence of which many of the species are objects of cultivation in all civilized countries. In England, where they are exotics, they are among the most highly valued of ornamental plants, and every species which can bear the climate, or which will thrive in conservatories, has been collected with great care, whenever opportunities have offered, so that few now remain to be imported. Among the most ornamental of the hardy kinds are the M. grandiflora of Carolina; M. glauca, of which there are many varieties; M. macrophylla, the flowers of which are among the largest in the vegetable kingdom; and the Tulip-tree, Liriodendron tulipifera, a large tree with singular truncate leaves. In Bengal the air is often perfumed with the fragrance of the Tsjampac, a species of Michelia; while in China and the Malayan Archipelago others are equally well known for their ornamental characters. Nor are the plants of this order less useful than beautiful. It is probable that they are all valuable for the febrifugal qualities of their bark. Magnolia glauca is among the best bitter and aromatic species known in medicine, and the Tulip-tree affords to the North American settler a substitute scarcely inferior to it.

The genera Talauma and Magnolia have the very singular property of dropping their seeds out of the back of the seed-vessels when ripe, allowing them to hang down, each suspended by a long extensible elastic cord, composed of delicate spiral vessels.



A branch of Talauma pumila,

1, a head of ripe fruit with the seeds hanging down by their cords; 2, a vertical section of a seed, showing the minute embryo lying in copious albumen.

In consequence of the seeds of Magnoliaceæ containing an abundance of oil which often becomes rancid soon after they are gathered, it is difficult to transport them to a considerable distance in a living state. The best method of succeeding in that object is to pack the seeds in earth as soon as they are ripe, pressing them close and securing them in a box. Under such circumstances they will preserve their vitality for several months.

MAGNUS, ALBERTUS. [Albertus Magnus.]

MAGO. [Carthage.]

MAGO. [Columella.]

MAGPIE. [Corvidæ, vol. viii., p. 68.] In addition to the habits of this bird and its geographical distribution stated in the article above referred to, M. Temminck quotes M. Boié as authority for its building its nest in edifices, and as being very common in Norway. It lives as high up as Lapland, and is common in the Morea. Dr. Von Siebold and M. Bürger observed it in Japan, where it is known by the name of *Kasasi*, and is precisely identical with the European magpie.

MAHÂBALIPURAM ('the city of the great Bali'), a village on the Carnatic coast, in 12° 36′ N. lat. and 80° 16′ E. long., about 35 miles south from Madras. In the immediate neighbourhood of this village are a great number of antient sculptures in a high state of preservation. They consist of groups of human figures, lions, elephants, bulls, monkeys, and cats, all of the natural size, and various other animals or monsters. These figures are all cut out of solid blocks of granite, and were evidently connected with mythological subjects.

In the face of a granite rock behind the village is an excavated gallery with pillars, and near to it is another large excavation, the walls of which are covered with sculptures, having reference to the Hindu mythology. To the north of the village is a temple containing a statue of Ganesa, thirty feet high, which is cut out of a single block of granite; and about half a mile on the south side is a group of temples from seventeen to thirty-six feet in height, formed of the same material. Some smaller caves are seen in the neighbourhood, and everywhere about are scattered fragments of sculptures similar in character to those above described.

A temple dedicated to Vishnu, a tank, and some architectural ruins on the neighbouring plain, are held by the natives to be of an equally remote antiquity with the sculptures, but this opinion does not appear to be well founded. The inhabitants have a tradition that the city of the great Bali stood on the shores opposite to the site of the present village, but is now covered by the sea. It appears however that the opinion of the sea having swallowed up or washed away several pagodas is groundless, and it is even doubtful if the tradition above referred to does not rather apply to a place on the Malabar coast, where the memory of a prince called Balin is preserved and celebrated by an annual festival. It appears that the true Sanscrit name of this place on the Coromandel coast is 'Mahâmalaipura,' or 'the city of the great mountain.'

(Babington, *On the Sculptures and Inscriptions at Mahâmalaipur*, in *Asiatic Transactions*, vol. ii.)

MAHÂBHÂRATAM, or BHARATAM ('belonging to Bhârata and his descendants'), the most celebrated epic poem of the Hindus after the 'Râmâyana.' A passage in the introductory part of the work (1, 2296) has given ground for the assertion that it contains the round number of a hundred thousand distichs or slocâs; but in order to complete this enormous amount, the 'Harivansa,' a mythological history of Krishna, and sundry other pieces, have been added. The eighteen component fictions (Parva) of the 'Mahâbhârata' contain about 85,000 slocâs, and even these may be reduced to 24,000 distichs, of which the original 'Bhârata,' without its episodes, is said to have formerly consisted. (1, 101.) The principal subject of the 'Mahâbhârata,' to which its middle sections particularly are consecrated, is a long civil war between two dynasties of antient India, the Kurus and Pândus. Both were descended from Bhârata, king of Hastinapur, whose first-born son, Dhritarâshtra, the father of Duryodhana and the Kurus, ought to have succeeded to the throne; but this prince being blind, the sceptre was seized by his cousin Yudhishtiras, the eldest of the five Pându princes. At first the usurper was driven off by his uncle Duryodhana, and even banished to a wilderness for twelve years; but as the Pându brethren were favoured by their friend and ally, the heavenly Krishna, and as they were themselves, according to the legend, begotten by several deities, after a long struggle against the Kuru princes, and after many perilous adventures and bloody exploits, they were finally established in the sovereignty of India.

In this main texture of the 'Mahâbhârata' is interwoven a great variety of episodes; or more properly speaking, the history of the Pândus and Kurus is the leading thread by which an immense collection of antient traditions, moral reflections, poetical descriptions, and popular stories of every kind, has been connected. It is very important to observe that these accessory elements, which now form almost three-fourths of the whole epopee, are stated in the poem itself not to be constituent parts of the original 'Bhârata;' in fact they are for the most part very loosely inserted; and as many of them are epic productions of considerable length, the principal theme is not only frequently interrupted by intervening episodes, but often totally lost sight of, even when the most active progression should be expected. Thus, for instance, the metaphysical system of Patanjali is propounded by Krishna, in the eighteen lectures of the much admired Bhagavadgîtâ, just when the army stands disposed in full array and ready for battle. Besides a vast number of various short tales and fictions of every description occasionally inserted, the episodical compositions of the 'Mahâbhârata' may be divided into two general classes of a more distinct character and of peculiar importance. The first class, to which the early sections of the 'Mahâbhârata' are particularly consecrated, is occupied in solving theogonical and cosmogonical problems, blended with those wild and fantastical conceptions by which the metaphysical mind of the Hindus is so deeply attracted. To these, in the last chapters of the work, and after the conclusion of the great war, are added didactic and moral episodes on religious duties and sacrifices, on solitary and penitential life, and on final beatitude, forming almost a complete system of Indian ethics, and a compendium of the Brahminical faith. The second class of episodes, which may, although in some respect improperly, be called historical, consist of various and ample traditions of former epochs, and are occupied in recording the origin, genealogy, and history of antient kings and heroes; in giving an account of their government and practice of warfare, their individual adventures, and their splendid actions; and in exhibiting their piety and devotion in fulfilling those duties of a religious life by which the favours of the heavenly beings are to be acquired. These and similar narratives are chiefly accumulated in the third and longest section of the 'Mahâbhârata,' called Vanaparvan (book of the forest), where they are told by the Brahminical sage Markhandeya, for the purpose of entertaining, consoling, and animating the dejected spirit of the Pandu princes during their exile in the wilderness. In this respect the episodical pieces of the 'Mahâbhârata' may be compared with the rhapsodies sung by Phemius and Demodocus in the Homeric poems, and as many of them are marked with a peculiar simplicity of manners and customs, they might almost seem of an older date than the main body of the epopee, of which they are totally independent. This leads us to the original composition of the 'Mahâbhârata,' which in the introductory part of the poem is thus related.

The most celebrated sages, with their disciples, being assembled at a splendid sacrificial festival, the venerable Krishna Dvaipâyana, with the surname of Vyâsa, who had been an eye-witness of the great civil war, is requested by king Janamejaya to give an account of those bloody events, in which, two generations ago, his own ancestors had played a fatal part. This task, being declined by Vyâsa himself, is readily performed by one of his disciples, Vaisampâyana, who, being duly instructed, and from memory familiar with the heroic poem, recites it at full length to the listening assembly. A similar festival being afterwards celebrated by king Saunaka, the same proceedings are repeated, and Sauti, whose father had been a disciple of Vyâsa, undertakes the recital of what is now considered the original 'Bhârata.' Neither in these nor in other instances is a written copy of the text mentioned; it was in fact only committed to memory and handed down by oral tradition, until the increasing mass of subsequent episodes, more or less connected with the primitive subject, urged the necessity of a final arrangement; and, to avoid further interpolations, a summary of the contents was prefixed to the whole collection, now existing under the name of 'Mahâbhârata.' Notwithstanding the traditional character and the gradual growth of the poem, Vyâsa has been supposed not only its author, but even the operation of collecting its component parts has been attributed to him, as it was he who, according to Hindu tradition, collected the Vedâs and Purânás, and composed the Brahmasûtras of the Vedântine school. But as these operations could not be executed by the same individual, it has long been acknowledged that the name of Vyâsa (implying *disposition*) does not signify a distinct historical person, but rather an allegorical character, including the important fact that the four great parts of the sacred canon were digested by the same orthodox body of the antient Brahminical schools, by whom almost every branch of the traditional and scientific learning of the Hindus has been successively propagated and preserved. Hence a religious and priestly character prevails in the epic poetry of the Hindus; in this sense the 'Akhyâna' is often styled a fifth 'Veda,' and the 'Râmâyana,' as well as 'Mahâbhârata,' are in fact considered as the 'Sâstra' of the Kshatriya caste, for whose recreation, encouragement, and instruction they were originally designed. Compared with the 'Râmâyana' the 'Mahâbhârata' is wanting in unity and internal coherence; it is rather a collection of antient epic poems, gathered round the central history of the Kurus and Pândus: but for this very reason it far surpasses the former poem by a greater variety of pleasing scenes and attractive situations, particularly in its episodes, the characters of which are very often delineated with so peculiar a delicacy, and with so strongly marked an individuality, as to leave a powerful impression on the reader. Finally, and what is more essential, the 'Mahâbhârata' may be looked upon as a most ample source of every kind of antiquarian lore, and as the only Sanskrit work, if we except the 'Annals of Kashmir,' by which a considerable quantity of the most valuable historical fragments has been preserved. The truth of this will be shown in a series of learned essays lately begun by Prof. Lassen (in *Zeitschrift für die Kunde des Morgenlandes*). The great war itself, which on astronomical calculations has been supposed to have taken place during the twelfth century B.C. (Works of Sir William Jones, iii., 213, vii., 77), is indubitably an historical event; and as Pându (white), Krishna (black), Duryodhana, Dhritarâshtra, and other names are allegorical, Prof. Lassen acutely suggests, that the war might be the long and serious contest between the Brahminical tribes and the native occupants of the country. Leaving aside these questions, we only remark that although the 'Bhârata,' properly so called, is by no means contemporary with the events described in it, its pretensions to a very remote period of Hindu antiquity are sufficiently justified by internal evidence and the unanimous testimonies of subsequent writers. The poem is evidently of later date than the 'Râmâyana,' but neither the precise time in which it was composed, nor even the epoch of its finally assuming its present shape, can yet be ascertained.

Three large quarto volumes have already appeared of a complete edition in the original Sanskrit, carefully collated by learned Pundits with the best manuscripts in the library of the Sanskrit College of Calcutta, and published by the Asiatic Society of Bengal. Besides a number of detached fragments and single stories of the 'Mahâbhârata,' faithfully translated by Sir Charles Wilkins, Prof. Wilson, and Mr. Milman, such as *The Churning of the Ocean*, the *Story of Dushwanta* and *Sacuntalâ*, &c. (*Annals of Oriental Literature; Oriental Quarterly Magazine*, 1825; *Quarterly Review*, vol. xiv.), the following episodes have appeared in the original Sanskrit: 1. *Nala and Damayanti*, published by F. Bopp, Lond. 1819; Berlin, 1832. Translated into English verse by H. H. Milman, Oxford, 1835. 2. The *Bhagavadgîtâ*, by A. W. Schlegel, Bonn, 1823. An English prose translation was published by Sir Charles Wilkins, London 1785. 3. *Indralokâgamanam*, *Hidimbabadha*, *Brâhmavilâpa*, *Sundas and Upasunda*, and *Tilottamâ*, by Bopp, Berlin, 1824. 4. 'Diluvium cum tribus aliis Mahâbhârati præstantissimis episodiis,' by Bopp, Berlin, 1829.

MAHANADA. [Hindustan, p. 216.]

MAHANUDDY. [Hindustan, p. 210.]

MAHMOOD I., son of Mustapha II., was raised to the throne of the Ottomans after the deposition of his uncle Ahmed III. in 1730. He continued the war begun under his predecessor against Nadir Shah of Persia, but with no success, and made peace in 1736. A war with Russia followed, in which the Russians took Ockzakow and Kilburn in 1737, and, the Austrians having joined them, invaded Wallachia. The Austrian forces being defeated at Krotska on the Danube, the court of Vienna submitted to a disadvantageous peace in 1739, by which it gave up not only its recent conquests, but also the important town of Belgrade, the conquest of a former war. Peace was soon after made between Turkey and Russia, and the latter power restored Ockzakow. A new war broke out with Persia in 1747, and terminated by a treaty unfavourable to the Ottomans. Mahmood took little part in all these transactions, but left all the cares of state to his ministers and favourites. He died in December, 1754, of the fistula, his death being hastened by an effort which he made to ride to the mosque on a Friday, to show himself to his subjects, among whom reports of his death had been circulated. He was then fifty-eight years of age.

MAHMUD, Soboktegin of Ghisni, the founder of the Gasnevide dynasty, succeeded to the sovereignty of Chorasan and Bokhara (A.D. 997), which his father Emir Nasireddin Soboktegin had occupied under the caliphs El-Thai-Billah and Kader-Billah. After having assumed the title of sultan, which was readily granted to him by the caliph, Mahmud subdued the circumjacent provinces of East Persia, made Ghisni his capital, and totally shook off the yoke of his legitimate sovereign. Bound, as he deemed himself, by the most solemn vow to adhere to the precept of the Koran, which enjoins the propagation of the Islam and war against the unbelievers as a matter of faith; or stimulated rather by ambition and covetousness, ill-concealed under the mask of religious duty, he directed his arms against the quiet and peaceful Hindus, and first attacked Jeipal, the neighbouring king of Lahore, in 1001. This expedition having proved successful, Mahmud invaded Hindustan almost every year, and in no less than fourteen subsequent incursions, made in various directions and as far as the carelessness and the feeble resistance of the Hindu rajahs would permit him to proceed, he devastated the provinces, ravaged and plundered the cities, destroyed the places of religious worship, and murdered the inhabitants, always returning with an immense booty. In the year 1016 the far-famed city of Kanoge was destroyed; and shortly after the antient and magnificent Mathura, whose palaces and temples of marble and alabaster filled even their savage conqueror with respect and religious awe. The remotest expedition of Sultan Mahmud was directed against the celebrated temple of Somnat (Somanâtha) in Guzerat (1025); and although these transitory invasions of Hindustan were only undertaken to satisfy his fanaticism and avidity, and without the intention of permanently occupying the ravaged provinces, he now almost thought of making the city of Naherwaleh his new capital. Nevertheless Mahmud retired to Chorasan, loaded with the inestimable treasures of the Indian temples. After having once more attempted a predatory excursion into Multan, he died at Ghisni, 1030, neither much lamented nor extolled by his contemporaries, whatever flattery had done during his life-time by praising his justice and equity, and softening the leading features of his character, which were cruelty and avarice. All that can be said in praise of Sultan Mahmud is, that men of learning were attracted by the fame of Ghisni, which he adorned with the most splendid buildings, and by the lustre and magnificence of his court; and the new epoch of Persian poetry, of which the Shah-Nameh is the most eminent and imperishable monument, was encouraged by the sovereign. But as the satirical poems of Ferdusi testify, even his liberality and favours were in a great degree dependent on his capricious temper, and were often bestowed in a very niggardly manner. About three miles from the modern city of Ghisni, the tomb of Mahmud is still preserved, and in remembrance of his having been a zealous defender of the faith, Mohammedan priests are maintained, who constantly read the Koran over his grave. (Mirchond, *Historia Gasnevidarum*, ed. Wilken, Berlin, 1832.)

MAHOMET I., son of Bayazid I., was sandjak, or governor, of the town and district of Amasia when his father was defeated and taken prisoner by Timur at the battle of Ancyra (July, 1401). The invader having left Asia Minor, Mahomet's elder brothers Mousa and Solyman disputed their father's succession between them. Mahomet took no part in their quarrel, but continued to administer his province, and strengthen himself in it, until Mousa, having prevailed against Solyman, put him to death, upon which Mahomet declared war against Mousa, who was defeated and killed, and Mahomet became sole sultan of the Ottomans, A.D. 1413.

Mahomet was the restorer of the Ottoman empire, which he found in a state of anarchy. He extended his conquests into Europe, and obliged the princes of Bosnia, Servia, and Wallachia to pay him tribute. He also equipped a fleet to resist the attacks of the Venetians by sea. He died, after nine years' reign, A.D. 1421. He was succeeded by his son Mourad II.

MAHOMET II., son of Mourad II., was proclaimed emperor of the Ottomans after the voluntary abdication of his father in 1444; Mourad however was obliged by a mutiny of the Janizaries, who objected to his son's youth, to resume the reins of government till his death, which happened at the beginning of 1451, when Mahomet, then twenty-two years of age, commenced his reign. He broke the truce existing with the Byzantine emperor, by building a fort on the European side of the Bosporus, opposite to the fort of Anatoli-hissar, which his predecessor Bayazid had built on the Asiatic coast of the straits, by which means Mahomet established a complete command of the Bosporus. This led to remonstrances from Constantine Palæologus, the Byzantine emperor, which were received with scorn by Mahomet, who went on subduing the Greek towns on the Propontis and the Euxine, ravaged Thrace, and invaded the Peloponnesus. At last, having assembled an immense host, stated by some at 300,000 men, with a formidable artillery, and a fleet of 120 sail, Mahomet laid siege to Constantinople in April, 1453. After fifty-four days' siege the Ottomans carried the city by storm on the 29th of May, 1453. Constantine fell bravely fighting in the breach, covered by a heap of the slain. After three days of plunder and massacre Mahomet restored order, released most of the prisoners, granted to the conquered the free exercise of their religion, and gave them the use of one half of the existing churches; the remainder, and the best of them, Santa Sophia among the rest, were transformed into mosques. Mahomet remained nearly three years at Constantinople, after which he returned in triumph to Adrianople, which was then the residence of the Ottoman sultans.

In 1456, after invading Servia, he laid siege to Belgrade, but was opposed and defeated by John Hunnyades, a gallant Hungarian noble, who was regent of the kingdom in the absence of king Ladislas. This was the first check which the Mohammedan arms encountered in their advance towards Western Europe. At the same time Mahomet's generals were defeated in the mountains of Albania by Scanderbeg. The Turks however took Corinth and the Morea. In 1461 they took Trebizond, and put an end to the dynasty of the Comnenes. In 1462 they took Lesbos and other islands of the Archipelago. They next conquered Bosnia, and Mahomet, after promising safety to the prince of that country, had him put to death. In 1465 Mahomet marched against Scanderbeg, but was defeated under the walls of Croia. But Scanderbeg lost all the open country, and dying soon after, left his infant son John Castriot under the guardianship of the Venetian senate. The Venetians attacked and plundered the coasts of Thrace, Asia Minor, and several of the Greek islands. In 1470 Mahomet laid siege to the town of Negroponte, the stronghold of the Venetians in the Ægean Sea. The Provveditore Erizzo, after a gallant resistance, being obliged to capitulate, Mahomet promised to spare his head, but by a barbarous equivocation he had him sawed in two, saying that he had not promised to spare his sides. The Venetians by means of their commercial agents excited against Mahomet, Husun Hassan, shah of Persia, who invaded Asia Minor, and took Tocat in 1472. [Contarini, Ambrogio.] Mahomet hastened to encounter him, and a battle was fought near Trebizond, in which the Turks had the advantage over the Persians, who withdrew beyond the Euphrates.

In 1475 Mahomet took the Crimea, the khan of which became his tributary. The Turks invaded also Dalmatia and Frioul, in 1478, and advancing as far as the Tagliamento, obliged the Venetians to sue for peace, which was concluded between them and Mahomet, in January, 1479, by which Venice gave up Scutari and other fortresses in Illyria, Albania, and the Morea. In 1480 a Turkish force landed at Otranto, and spread alarm throughout Italy. In the same year the Turks attacked Rhodes, but were defeated by the Knights of St. John, under their grand-master Peter d'Aubusson. Mahomet was greatly irritated at the news of this defeat; and while he was making preparations for resuming the attack in person, he died at Teggiar Zaïr in Bithynia, in May, 1481. His remains were carried to Constantinople and interred with the following epitaph:—'I designed to conquer Rhodes and subdue proud Italy.'

Mahomet was a successful conqueror. He was cruel, like most of the Ottoman warriors; but he was not an illiterate or rude barbarian. He knew several languages, Persian, Arabic, and Greek; was fond of poetry, and was a good letter-writer. Several of his letters have been translated into Latin, and published by Landini, Lyon, 1520. Three of his letters, addressed to Scanderbeg, are found in Melchior Junius's Collection, 1595. He founded two medresses, or colleges, at Constantinople. Several stories of his cruelty, such as that against a Greek female, Irene, and the story about Bellini the painter, rest upon doubtful authority. [Bellini, Gentile.] His bad faith however is fully proved, in the instances of the unfortunate Erizzo, of the prince of Bosnia, and others. In Turkish history he is styled Mahomet the Great and the Conqueror. (Knowlles's *History of the Turks*; Mignot, *Histoire de l'Empire Ottoman*.)

MAHOMET III., succeeded Mourad III. in 1595. He began his reign by putting to death all his brothers. Giving himself up to idleness and pleasure, he left the government in the hands of his ministers, who were under the influence of his mother. His troops were beaten in Hungary by the Imperial troops, and by Battori, prince of Transylvania, and they lost Gran and other places. Mahomet, being roused from his apathy, collected a large force, with which he entered Hungary and took Agram; but he soon left the army, and hurried back to his capital. The war was carried on in Hungary by his generals, but with no success to the Ottoman arms. In the meantime revolts broke out, and the Asiatic provinces and the janizaries at Constantinople mutinied. In the midst of all these disorders Mahomet died, in 1603, and was succeeded by his son Ahmed I.

MAHOMET IV., son of Ibrahim I., succeeded his father, who was strangled in a meeting of the janizaries in 1654, when Mahomet was seven years of age. His mother assumed the regency; but a fresh revolt of the janizaries soon overthrew her power, and she also was put to death. Mahomet Kuperli, or Kupruli, was now raised to the post of grand-vizier, or prime-minister. Like many other officers who have distinguished themselves in the annals of the Ottoman empire, Kupruli was an Albanian. He and his son Achmet after him were the ruling ministers during the greater part of the reign of Mahomet IV., who troubled himself little with state affairs, being chiefly engrossed with the sports of hunting and other pastimes. The two Kuprulis spread a last ray of departing glory over the decline of the Turkish state. The elder Kupruli, after repressing by severe measures the spirit of insurrection within, formed a new fleet to oppose the Venetians, who, under the two gallant brothers Mocenigo, threatened to force the passage of the Dardanelles, in 1657. He also sent fresh troops to carry on the war in the island of Candia. Meantime the war was raging in Hungary between the Turks and the emperor Leopold I. The Turks advanced as far as Neuhausel, which they took, spreading alarm to the gates of Vienna; but they were defeated by Montecuccoli, general of the Imperial forces, at the battle of St. Gothard, 1663, after which peace was concluded. The same year Mahomet Kupruli died, and his son Achmet Kupruli became grand-vizier. In 1667 Achmet went in person to Candia, and the siege of the capital town of the same name began in real earnest. The Venetian general Morosini directed the defence. In September, 1669, Morosini, after a most gallant resistance, having exhausted all his resources, made an honourable capitulation, and at the same time concluded a treaty of peace between Venice and the Porte upon terms more favourable than might have been expected. [CANDIA.] Kupruli, unlike the barbarian Mustapha, who in the preceding century had atrociously violated the capitulation of Famagosta [CYPRUS], faithfully kept the conditions granted to the Venetian garrison, and allowed a free passage to all the inhabitants who chose to embark.

In 1671 war broke out between the Turks and Poland, and Mahomet IV. led his army in person; but he was surprised in his camp at Budchaz by John Sobieski, grand-marshal of Poland, and the sultan was obliged to seek safety in flight. In the following year Sobieski took the fortress of Kotzim, and drove the Turks to the south of the Danube. In 1675 a formidable Turkish host, commanded by the bashaw of Damascus, who for his bravery had earned the name of 'Shaitan' (the devil), entered Poland. Sobieski, who was then king, resisted all their efforts with a handful of men, and at last obliged them to ask for peace, which was concluded in 1676.

In 1683 the Turks, after seven years' preparation, put into motion the most formidable army which Europe had seen for a long time. They swept over Hungary like a storm, and marched direct upon Vienna. It is generally admitted that Louis XIV. was privy to their plans. The emperor Leopold and his family left their capital, and Germany and Italy were thrown into consternation. On the 15th of July Vienna was invested by the grand-vizier Kara Mustapha (Kupruli was dead), at the head of 300,000 men, Turks and Tartars. On the morning of the 11th September Sobieski and Charles duke of Lorraine, at the head of their combined forces, 40,000 strong, reached the summit of the Calemberg, from which they beheld the Austrian capital and the wide-spread glittering tents of the Ottomans. On the following day Sobieski attacked and drove the Turks to their formidable entrenchments, against which, at five o'clock in the afternoon, he led a general assault, carried everything before him, and obliged the vizier to fly after making a gallant resistance, leaving his camp, his baggage, and his artillery in the hands of the Christians. The Turks subsequently lost Hungary. In consequence of these disasters the janizaries at Constantinople revolted in 1687, Mahomet IV. was deposed, and Solyman III. was raised to the throne. Mahomet died in confinement in 1691.

MAHOMETANISM. [MOHAMMEDANISM.]

MAHON, PORT. [MINORCA.]

MAHRATTA LANGUAGE. [HINDUSTAN, p. 227.]

MAHRATTAS, or MAHARATTAS. The origin of these people, whose wars have filled so large a space in the history of British India, is involved in much obscurity. The country possessed by them before the modern invasion of India by Europeans is supposed to have included Candeish, Boglana, part of Berar, extending to the north-west as far as Guzerat and the river Nerbuddah, and a tract of country on the west coast lying between Surat and Canara. A great part of these countries consists of mountains and defiles, which offer great natural facilities for the prosecution of predatory and of defensive warfare. It is supposed that the name Mahratta was derived from Mheerut, or Mharat, a district which under the sovereigns of the Deccan formed part of the province of Dowlutabad. The earliest mention that we find of the Mahratta tribes is in 1306, when Cafoor, a slave and general of Alla, is said to have 'subdued the country of the Maharattas, which he divided among his Omrahs.' The Mahratta empire, as it takes a place in modern history, was founded in the latter half of the seventeenth century, in the reign of Aurungzebe, by Sevajee, the son of Shahjee, a Hindu in the service of the king of Bejapore, from whom he received a jaghire in the Carnatic, with the command of 10,000 cavalry. His first act was the seizure of the Zamindary of Poonah, on which occasion he increased the number of his soldiers, and levied contributions in all the neighbouring districts. Sevajee died in 1680, and was succeeded by his son Sambajee, a man of considerable talent, but who was unable to withstand the power of Aurungzebe, and, falling into his hands, was cruelly put to death in 1689. His son Sahoo Raja, who had also fallen into the hands of the emperor, reigned in name only until 1740, when he died; but at the death of Sambajee, a great number of chiefs, availing themselves of the natural facilities offered by the country, issued from various points in the mountains, and kept up a constant predatory warfare in the neighbouring provinces, plundering and devastating wherever they penetrated. The wealth thus acquired by them caused them to be joined by vast numbers of adventurers, as well as by many Zamindars, and after a long struggle for their subjection, they were, at the death of Aurungzebe in 1707, more powerful than ever. From the death of Sambajee in 1689 till the year 1818, the nominal sovereign or raja of the Mahrattas had no real power, but was a prisoner, confined in the hill-fortress of Satara, while the government was administered by the Peshwa, or minister, whose office became hereditary in the family of Balajee Bishenauth, its first possessor, who fixed his residence at Poonah. He was succeeded by his son Balajee Bajerow, who died in 1761. The next Peshwa was Madhoo Rao, who filled the office for 11 years, and dying was succeeded by his son Narrain Rao. This chief was murdered in 1773, concerning which event very different statements are given. By one it is said that the murder was committed by his uncle Ragoba with the design of usurping his office, but that the usurpation was prevented by twelve chiefs, at the head of whom was Balajee Pundit, better known as Nana Furnavese, who set up Sevajee Madhoo Rao, the posthumous son of Narrain, and administered the government during his minority. Mill (*History of British India*, vol. ii., p. 356) gives a very different version; he states that the murder was committed by the chiefs before mentioned, that the fact of Sevajee Madhoo Rao being the son of Narrain was disputed, and that Ragoba, whose right to the succession was perfect, fled to Guzerat, where he obtained the promise of support from the Guicowar. For some time preceding these events the English government had desired the possession of Salsette and Bassein, then forming part of the possessions of the Mahratta government; and this appearing a favourable opportunity, they formed a treaty with Ragoba, engaging to replace him in his office, and they took possession of Salsette and Bassein, much against the will however of Ragoba, who offered other territory and revenue to a larger amount as the price of British assistance. Upon his giving way on this point, an English force of 25,000 men was put in motion in his favour. Negotiations had at the same time been opened with the authorities at Poonah, who yielding to the cupidity of the English government concerning Salsette and Bassein, the latter was induced to withdraw all active assistance from Ragoba, who retired to Surat with only 200 attendants. Sevajee Madhoo Rao died in consequence of an accidental fall in 1795, and after some considerable dissensions his son Bajerow was declared Peshwa. This chief continued in power until October, 1802, when his forces being totally defeated near Poona by Jeswunt Rao Holcar, he fled to Bassein and placed himself under the protection of the British government. In the following year he was reinstated in his capital by General Wellesley (now the duke of Wellington). Bajerow proved to be of an intriguing disposition and very avaricious. He permitted his officers to practise all manner of extortion, that he might in the end seize on their ill-gotten treasure. In 1815 he was detected in the endeavour to form a general confederacy against the English; his capital was in consequence surrounded, and he was forced to cede in perpetuity districts yielding a revenue of 340,000*l.* and to make a temporary surrender of Singhur, Poorunder, and Ryeghur, as pledges for the fulfilment of existing treaties. In November, 1817, the Peshwa, in defiance of all engagements, suddenly attacked and destroyed, having first plundered, the houses of the British residency near Poonah. This treacherous conduct was speedily punished, his forces were on the following day routed by the English troops, and he became a fugitive, and wandered about in various directions until June, 1818, when he surrendered himself to Sir John Malcolm, and renounced all sovereignty for himself and his family, upon the promise of an adequate pension. On this occasion the greater part of the Poonah territory, estimated at 50,000 square miles, came into possession of the English.

In the early period of Mahratta history the system prevailed of the nominal head of the people conferring large grants of land on the principal chiefs, and of delegating to them extensive powers of government. These chiefs, one by one, assumed the state and attributes of princes, but still, with that attachment to antient forms and that respect for hereditary power for which the Mahrattas have always been remarkable, they acknowledged the supremacy of the nominal head of the state, but either submitted to or evaded his authority as best suited their interest at the moment.

MAIA. [MAIIDÆ.]

MAIDEN HAIR, the common name of the Adiantum Capillus Veneris, a fern found wild in many parts of Europe, on damp shaded rocks. It is the *adianton* (ἀδίαντον) of the Greeks, and has probably gained its trivial name from its having formed a part of the preparations used by ladies for stiffening their hair. (Dioscorides, l. iv., c. 136.)

MAIDSTONE, a corporate town and parliamentary borough, in the parish and hundred of Maidstone and county of Kent, of which it is the county and assize town. Maidstone is situated on a pleasant declivity chiefly on the right bank of the Medway, about two miles above Allington lock, eight miles above Rochester, and 32 miles south-east by east from London. Till the lock was constructed on the river the tide came up to Maidstone. It consists of four principal streets, which are well paved and lighted, and it contains many well-built houses. There are two reservoirs for supplying the inhabitants with water, conveyed from a spring on the opposite banks of the Medway, which river is here crossed by a very antient stone bridge of several arches. The derivation of the name 'Maidstone' is not precisely known; at least, various etymologies are given by Camden, Hasted, and others. According to Nennius (*Catalogue of the Cities of Britain*), this place was called by the British *Caer Meguaid*, or *Medwag*, signifying the town or city of the Medway. At a very early period Maidstone formed part of the possessions of the see of Canterbury, and is entered in the general survey of Domesday under the title of the lands of the archbishop. The charters of incorporation are those of 3 Edward VI., 2 Elizabeth, 2 and 17 James I., 34 Charles II., and 21 Geo. II. The first of these was forfeited in the time of Queen Mary, in consequence of the supposed participation of the leading members of the corporation in the rebellion of Sir Thomas Wyatt.

The revenue of the corporation in 1835, arising from landed property, tolls, &c., was estimated at 1114*l.* The total debt at that time was 15,875*l.*, and the annual expenditure, the chief item in which was the interest on this debt, is supposed to be about equal to the income. Since the establishment of the police under the Municipal Corporation Act the expenditure has been considerably increased. The landed property has lately been sold, and a great part of the debt paid off. The town is divided into six wards: the town-council consists of 6 aldermen and 18 councillors.

The town is said to be in a thriving state. There are manufactories of felt and blankets, but these are of limited extent compared with the paper-mills, which employ upwards of 800 hands. The traffic up and down the river is considerable, and has been materially increased by the construction of the lock for improving the navigation. The imports consist chiefly of coal, timber, groceries, iron, and rags; the exports are mostly fruit, hops, stone from the quarries of Kentish ragstone in this parish and neighbourhood, and paper. The aggregate tonnage of the vessels passing through Allington lock is estimated at 120,000 tons, upon which tolls to the amount of 2600*l.* are annually collected.

There is no borough gaol: the justices of the borough commit all prisoners to the county gaol, and the expense of their maintenance, amounting to one shilling per day for each prisoner, is defrayed out of the borough-rate. On the east side of the river there are cavalry barracks. Nearly opposite to the town-hall is a spacious commercial room used as a Corn Exchange. The archbishop's palace is a Gothic structure, rebuilt about the middle of the fourteenth century. Since that time it has undergone considerable alteration, and in its present state is a pleasant and convenient residence. The chapel of Newark Hospital, which was built in the thirteenth century, is a small but beautiful specimen of the early pointed style. Maidstone formerly contained a college, consisting of a master, sub-master, and four priests, founded by Archbishop Courteney in the reign of Richard II. It was suppressed by Edward VI., at which time its nett annual revenue was 159*l.* 7*s.* 10*d.* Among the persons of literary eminence who were connected with this college was the learned William Grocyn, the friend of Erasmus. He died in 1522, and was interred at Maidstone. (Wood's *Athenæ Oxon.*) There was also a fraternity of Corpus Christi, and upon the suppression of this fraternity the buildings belonging to it, then called 'The Brotherhood Hall,' were purchased by the corporation, who established the free grammar-school, which still exists, but is not at present in a very flourishing condition. Freemen have the privilege of sending their sons to this school, where they receive a classical education gratuitously, but for other branches a charge is made by the master, who receives a salary of 23*l.* 12*s.* per annum from the funds of the corporation, and has the management of certain lands in Romney Marsh confided to him, these lands constituting the principal endowments of the school. There are exhibitions, founded by Robert Gunsley in 1618, for four scholars to University College, Oxford; two to be elected from this school, and two from the free grammar-school of Rochester. Besides the grammar-school there are a proprietory school, four charity schools, nineteen almshouses, a medical dispensary, and other benevolent institutions. Maidstone is in the diocese of Canterbury. The living is a perpetual curacy in the patronage of the archbishop, producing a net income of 720*l.* The parish church of All Saints, which is one of the largest in the kingdom, was built in the fourteenth century; the new church was built a few years ago. There are also nine places of worship for Dissenters. The population of the borough, which is coextensive with the parish, was 15,387 in the year 1831, exclusive of the prisoners confined in the county gaol, and is still increasing. The assessed taxes collected during the preceding year amounted to 4784*l.* Maidstone has returned two members to parliament continuously from the reign of Edward VI. The county gaol at Maidstone is a modern building, constructed in 1818 on the improved radiating plan, at an expense of 200,000*l.* According to the Gaol Returns transmitted to the secretary of state it appears that in the year 1833 the general state of the prisoners as to morals, discipline, employment, &c., was eminently satisfactory. The total number then confined was 403; the gaol is capable of containing 453 in separate sleeping cells. The hours of labour are from six in the morning to half-past five in the evening, when the daylight admits; and at other times of the year from daylight in the morning till half an hour before sunset in the evening. By means of Sunday and day schools, conducted under the direction of the chaplain, provision is made for the instruction of prisoners of all classes. (*Parliamentary Papers*, 1834, vol. xlvi.)

There are four fairs held annually on the 13th of February, 12th of May, 20th of June, and 17th of October; the last is a large hop-fair.

(*Corporation, Boundary, and Church Revenue Reports*; Hasted's *History of Kent*; *Beauties of England*; Camden's *Brit.*, &c.)

MA'IIDÆ, or MAIANS, the second tribe of the family of *Oxyrhynchi*, according to the system of M. Milne Edwards, composed of brachyurous crustaceans, whose *carapace*, nearly always very spiny, is, with some exceptions, much longer than it is wide. *Rostrum* generally formed of two elongated horns. First joint of the internal antennæ but little developed; that of the external antennæ, on the contrary, very large, and soldered with the neighbouring parts so as to be confluent with them; its external border always constituting a considerable portion of the lower wall of the orbit, and its anterior extremity united to the front before the level of the internal canthus of the eyes. The moveable stem of the antennæ always of considerable length. The *epistome* generally considerably wider than it is long, whilst the *buccal frame* is longer than it is wide. The third joint of the external *jaw-feet* is as wide as it is long, more or less dilated on the external side, and truncated or notched at its anterior and internal angle, by which it is articulated with the fourth joint, which is very small. The anterior *feet* of the female are in general hardly larger or longer than the others, and sometimes they are even shorter. The same conformation obtains in some of the males; but in general the first pair of feet in these last are longer and much larger than the second pair, and their length sometimes is equal to twice that of the carapace: they are directed obliquely forwards and outwards; the hand is never triangular, and the immoveable finger of the claw is not inclined downwards, so as to form a decided angle with the lower edge of the hand. The succeeding feet are generally of moderate length; those of the second pair are most commonly once and a half the length of the post-frontal portion of the carapace, but they are never twice as long as that portion; those of the third pair are hardly ever more than once and a quarter as long as the post-frontal portion of the carapace, and the other feet shorten in succession. The *abdomen* is ordinarily composed of seven distinct joints in both sexes; but sometimes this number varies in the different species of the same genus. (M. Edwards.)

Genera. Libinia. (Leach.)

This genus has the greatest relation to *Doclea* and *Pisa*, between which genera it establishes, in the opinion of M. Milne Edwards, a nearly insensible passage. The general form of the body in *Libinia* approximates closely to that of *Doclea*.

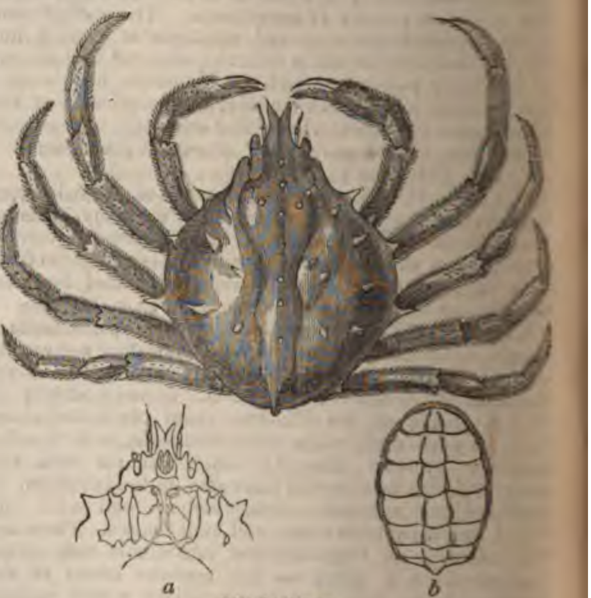
Generic Character.—Carapace very convex above, in general nearly circular, with its orbito-frontal portion placed sensibly above the level of its lateral borders, which are prolonged towards the mouth rather that towards the external canthus of the eyes. Sometimes the carapace is elongated a little, and bears a considerable resemblance to that of some of the *Pisæ*. *Rostrum* small, narrow, and notched in the middle; the *front*, measured between the orbits, is much narrower than the anterior extremity of the buccal frame; the anterior angle of the superior orbital border is projecting, but never reaches beyond the basilary joint of the external antennæ; the *orbits* are nearly circular, and directed very obliquely forwards and outwards; their external angle is formed by a large compressed tooth, which is separated from the rest of the wall of this cavity by two fissures; one superior and very narrow, the other inferior and more or less open. The stomachal region of the *carapace* is but little developed, but the branchial regions highly so, and their lateral border, which is armed with spines and very much curved, is directed towards the anterior angle of the mouth. The eyes are small and very short; the basilary joint of the external *antennæ* is short, but very much developed, and always wide in front, a disposition which occurs in *Pisa*, whilst the contrary is to be remarked in *Doclea;* the second joint of these antennæ is stout, short, cylindrical, and inserted on the sides of the rostrum at a distance nearly equal from the orbit and the antennary *fossette;* the third joint is rather smaller than the second, and the fourth is very slender and very short. The *epistome* is very small, and the whole of the *antennary region* is not more than half the length of the buccal frame. The external jaw-feet and the *sternal plastron* have the same form as in *Pisa*. The anterior feet are much longer than in *Doclea*, but less developed than in *Pisa;* they are always nearly of the same size as those of the second pair, and in general are much shorter even in the males; the hand is very nearly cylindrical, and has little convexity; the pincers are rounded or trenchant, and finely dentilated, and touch nearly throughout their length, a disposition which is rare in the *Pisæ*. The remaining feet much resemble those of the *Pisæ*, except that their last joint is longer, and never armed below with horny spines, as in them; the length of the feet diminishes progressively, and those of the second pair are not more than about once and a half as long as the post-frontal portion of the carapace; they are in general much shorter, and this character suffices to distinguish the *Libiniæ* from the *Docleæ*. The *abdomen* is composed of seven joints in each of the sexes.

Geographical Distribution of the Genus.—The seas of America, as far as is known.

M. Milne Edwards divides the genus into two sections; the first consisting of species which have the anterior and external angle of the basilary joint of the external antennæ obtuse, and not prolonged beyond the level of the internal one, and the slit of the inferior orbital border very narrow; the second consisting of species which have the anterior and external angle of the basilary joint of the external antennæ spiniform, and prolonged much beyond the level of the internal angle, and the slit of the inferior orbital border very wide.

Our limits will not permit us to give more than one example, and we select *Libinia spinosa*, a species belonging to the second section. The body is entirely covered with a short and brownish down, and it is about four inches (French) in length.

Locality.—The coasts of Brazil.



Libinia spinosa.

a, under side of head in detail; *b*, abdomen of female.

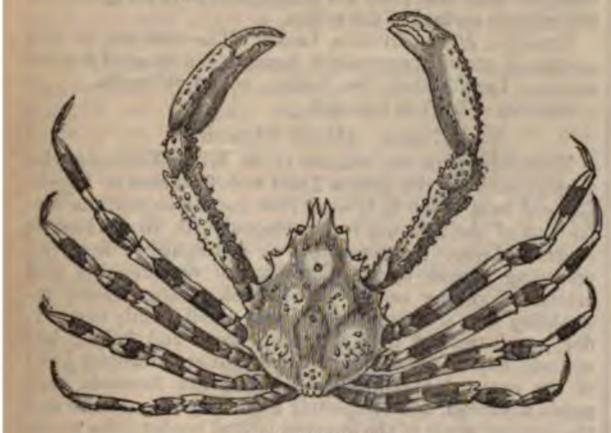
Herbstia. (Milne Edwards.)

Intermediate between the *Libiniæ*, the *Pisæ*, and the triangular *Mithraces*.

Generic Character.—Carapace more triangular than in *Libinia;* the stomachal region nearly as much developed as the branchial regions. *Rostrum* small, hardly longer than it is wide, and formed of two flattened horns, which are pointed and divergent, and the base of which occupies all the width of the front. *Orbits* oval-shaped, and directed obliquely forwards, outwards, and upwards; their superior border with two small fissures, which terminate anteriorly in a small spine, less projecting than that situated below and belonging to the basilary joint of the external antennæ; their inferior border is complete, and presents only a small fissure. *Eyes* large and retractile. Disposition of the *antennary region*, the *jaw-feet*, the *sternal plastron*, and the *feet*, essentially the same as in *Pisa*. The tarsi of the four last feet present small horny spines placed irregularly.

The only species known, *Herbstia condyliata*, has the body covered with a thin and fine down, is about two inches in length, and of a reddish colour

Locality.—The Mediterranean



Herbstia condyliata.

Pisa. (Leach.)

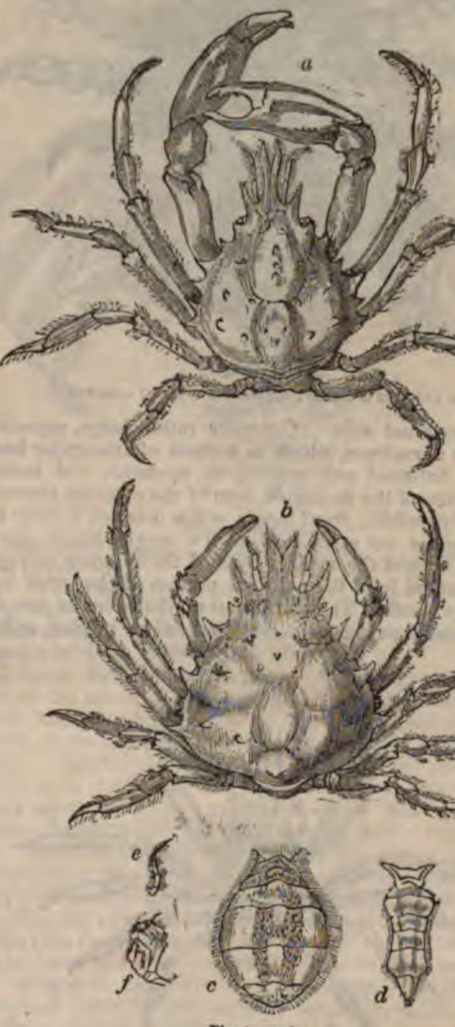
Generic Character.—Carapace gradually narrowed anteriorly for about three-fourths, and its latero-anterior borders prolonged obliquely in a nearly straight line up to a small distance from its posterior border; the surface very convex; the regions in general sufficiently distinct, and the stomachal region in particular very much developed. The front wider than the buccal frame, and armed with four horns directed forwards, the two external of which occupy the anterior extremity of the superior orbital border, and the two middle of which form the *rostrum*, which is always at least once and a half as long as it is wide. *Eyes* carried on very short peduncles, and bent backwards in the orbits, which are of an oval shape, and directed outwards and downwards; the upper border of these cavities with two slits, separated from each other by a triangular tooth, and their external angle situated rather below than above the lateral border of the carapace, which is there terminated. The orbital border interrupted below by a large notch. The internal *antennæ* without any peculiarity. The basilary joint of the external antennæ much longer than it is wide, only slightly narrowed forwards, and exceeding the level of the internal canthus of the eyes, but completely hidden above by the spiniform prolongation of the superior orbital border. The second joint of the antennæ slender and cylindrical, and inserted at a distance nearly equal from the antennary fosset and the orbit, a little without the level of the external border of the rostrum, so as to show itself between this prolongation and the lateral horns of the front. The third joint small and cylindrical, and the fourth rather long. *Antennary region* nearly of the size of the buccal frame, and the *epistome* large and nearly square. The second joint of the external *jaw-feet* prolonged from the internal side much beyond the level of its external angle; and the third joint much longer than it is wide, strongly dilated outwards, and deeply notched at its anterior and internal angle. *Sternal plastron* longer than it is wide. In the female the anterior feet are in general nearly of the same length as those of the second pair; but in the male they are remarkably longer and stouter; the hand is convex, and the fingers trenchant and finely dentilated on their terminal moiety. The remaining feet are cylindrical, and of moderate length; those of the second pair are not much longer than the post-frontal portion of the carapace; the length of the other feet diminish successively, and, in nearly all the species, their last joint is furnished below with small horny points, which are placed very regularly on one or two longitudinal lines, like the teeth of a comb. *Abdomen* composed of seven distinct joints

The whole of the body of the *Pisæ* is ordinarily covered with hairs, which are recurved at the end, and catch up foreign bodies which they touch; it is not rare therefore to see these crustaceans covered with sea-weeds and sponges. This disguise most probably answers the double purpose of enabling them to surprise their prey, and of protecting them from their enemies

Geographical Distribution of the Genus.—Nearly all the species live in the European Seas at considerable depths, and are often dredged up by the fishermen. After spring-tides they are frequently found hidden under stones at low-water. They are not used as food.

The species are divided into two sections, depending on the absence or presence of spiniform teeth on the upper border of the third, or third and fourth joints of the four last pairs of feet, &c. The first of these sections is separated into two subdivisions, dependent principally upon the rounded or triangular form of the posterior portion of the carapace. We select as an example one of the species of the first subdivision of the first section, *Pisa tetraodon.* This species is two or three inches in length, and has the body entirely covered with a kind of down and some crooked hairs: it is of a brownish colour.

Locality.—Very common on the English and French coasts.



Pisa tetraodon.

a, male; *b*, female; *c*, abdomen of female; *d*, abdomen of male; *e*, antenna; *f*, pedipalp.

Lissa. (Leach.)

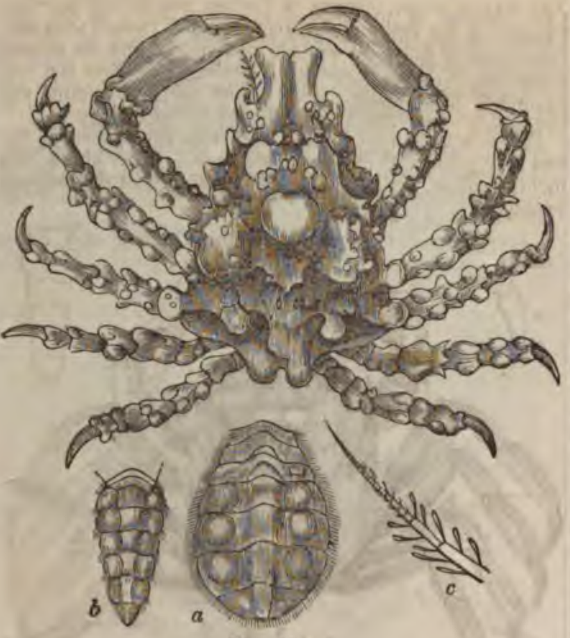
Very much resembling *Pisa*, and perhaps ought not to have been separated from it. The distinguishing characters of *Lissa* consist in the disposition of the *rostrum*, which is formed of two lamellose horns, truncated anteriorly, and wider anteriorly than they are at their base, and in the absence of spines on the tarsi. One species only, *Lissa chiragra*, is known; its length is about two inches, and the colour an intense red. The feet are furnished with some hairs, but the trunk is unarmed.

Locality.—The Mediterranean. Dr. Leach states that it is said to have been taken also on the coast of Cornwall by Mr. Swainson.

M. Milne Edwards remarks that *Lissa fissirostris* of Mr. Say seems to bear much analogy to *Hyas Aranea*; but M. Edwards cannot be certain that it belongs to the same genus from the author's description.

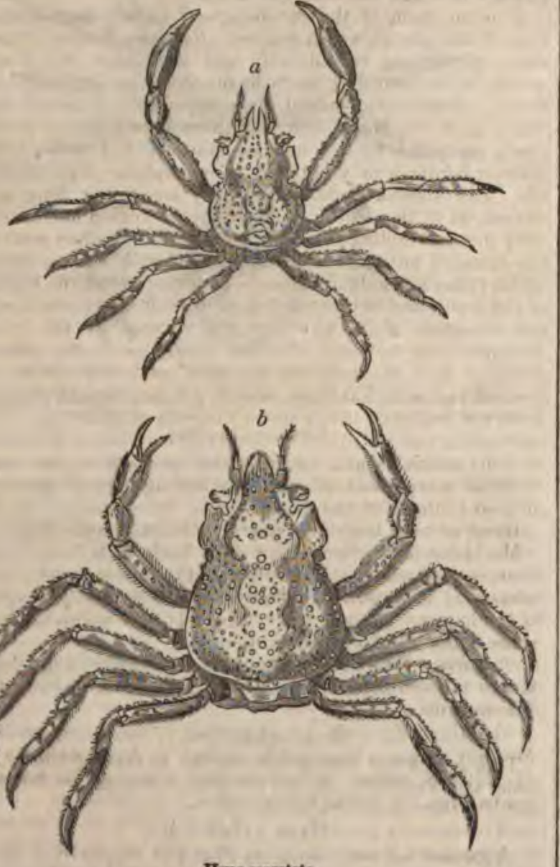
Hyas. (Leach.)

Approaching very nearly to *Pisa*, and especially to *Herbstia*, but easily distinguished by the form of the first joint of the *external antennæ*, which, instead of being cylindric as in nearly all the Oxyrhynchs, is flattened and enlarg



Lissa chiragra.
a, abdomen of female; *b*, abdomen of male; *c*, antenna.

on the external side. *Carapace* rather large, especially anteriorly; *rostrum*, which is formed of triangular horns that are flattened and convergent, moderate, and leaving the insertion of the moveable stem of the external antennæ completely visible; *front* large; *orbits* directed a little forwards; edges not spiny, and with a single fissure above. External edge of the basilary joint of the antennæ straight, and separated from the external portion of the orbit by a very large notch. The third joint of the *external jaw-feet* a little dilated outwards. *Feet* disposed as in *Pisa*, except that the four last pairs are longer, and have no spines on the inferior surface of the tarsus.



Hyas coarctata.
a, male; *b*, female.

Example, *Hyas coarctata*, Leach. The carapace of this species is strongly contracted beneath the external orbital angles. Length about two inches; colour yellowish.

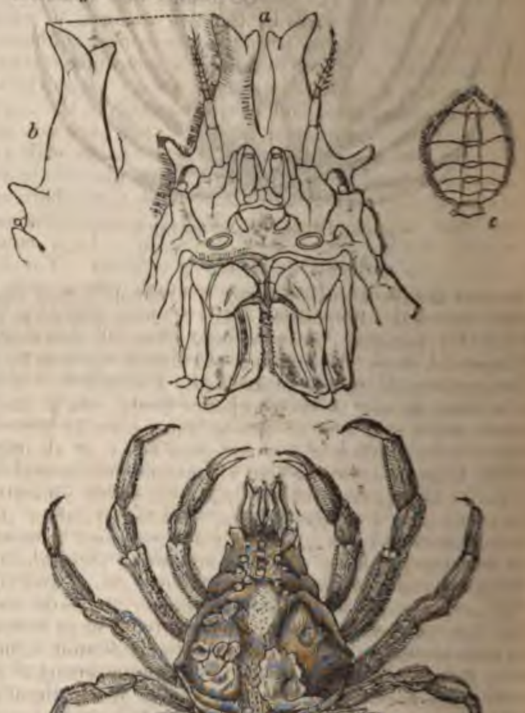
Locality.—English Channel.

Naxia. (Milne Edwards.)

Establishing, in the opinion of M. Milne Edwards, the passage between the genera *Lissa* and *Chorinus* of Leach. General form of the body as in *Pisa* and *Lissa*, and the disposition of the *rostrum* very analogous with that which is proper to *Lissa*. *Naxia* is however distinguished from the preceding genera by the disposition of the antennæ and orbits. *Carapace* nearly pear-shaped, *rostrum* much resembling that of *Lissa*. *Orbits* very small, nearly circular, deep, and marked with a fissure above and below, but without any hiatus at their inferior border. Basilary joint of the external antennæ wide but narrow forwards, very much advanced, and completely hidden by the rostrum and the anterior angle of the superior orbital border; the moveable stem of these appendages inserted under the *rostrum*, near the antennary fosset, and not beyond the edge of the external border of that prolongation, as in *Pisa*. *Epistome* very large.

Example, *Naxia serpulifera*, *Pisa serpulifera*, Edwards. Length about four inches; body covered with a brownish down, and the carapace often incrusted with *flustræ*, *serpulæ*, *sponges*, and the like.

Locality.—New Holland.



Naxia serpulifera, one-third its nat. size.
a, under side of the head in detail; *b*, one of the protruding points, with the eye in profile; *c*, abdomen of the female.

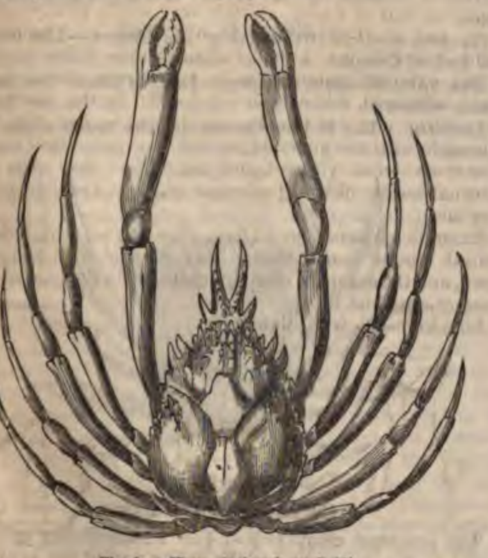
Chorinus. (Leach.)

Carapace longer and narrower than it is in nearly all of the Maians; but, in general form, not differing much from *Pisa*. *Rostrum* formed of two great pointed horizontal horns. *Eyes* retractile, and the *orbits* directed outwards and downwards; but the lower wall of these cavities is very incomplete. Basilary joint of the external *antennæ* narrow; their moveable stem inserted under the *rostrum*, and, in great part, concealed by it. *Epistome*, *jaw-feet*, *sternal plastron*, and abdomen, disposed nearly as in *Pisa*. Anterior feet longest, especially in the males, and the claw strongly curved inwards, dentilated and pointed, but a little hollowed out into a sort of gutter. The succeeding feet are cylindrical; those of the three last pairs of moderate length, but the second pair are very long: in the male they are in general once and a half or even twice as long as those of the third pair.

M. Milne Edwards divides the species of this genus into two sections; the 1st, consisting of three which have the superior orbital border scarcely marked, and formed by three spines, the anterior one very large, and the two posterior rudimentary; the 2nd consisting of those species which have the superior border lamellose and advanced.

We select as an example *Chorinus Heros*, the only species of the first section. Length from two to three inches, or rather more; rostrum, sides of the carapace, and four last pair of feet hairy; colour yellowish red.

Locality.—The seas of the Antilles.



Chorinus Heros (reduced one-half).

Mithrax. (Leach.)

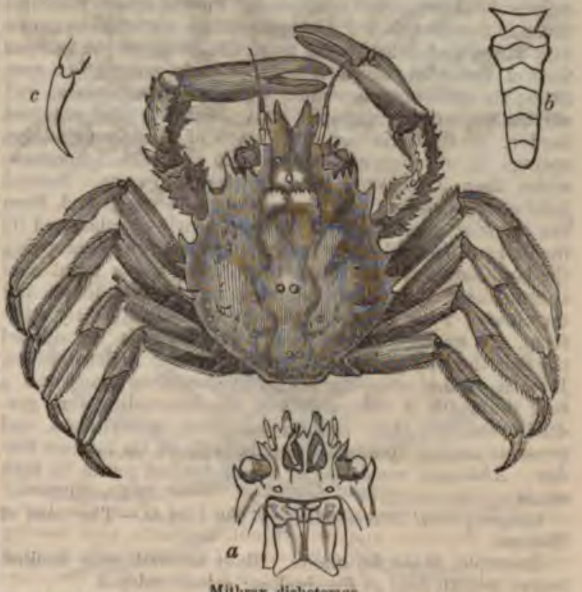
Carapace always a little convex above, and a good deal narrowed forwards; disposition of the different regions as in the other Oxyrhynchs. *Rostrum* bifid, generally very short, and separated from the internal canthus of the eyes by a rather considerable space; orbits nearly always armed with two or three spines at their superior border, one at their external angle, and one or two at their inferior border. Latero-anterior borders of the carapace spiny, or at least toothed. Internal *antennæ* bent a little obliquely outwards, and the frontal portion of the partition which separates them armed with a recurved spine. Basilary joint of the external antennæ large, and nearly always armed forwards with two strong spines. The second joint of these appendages is, on the contrary, narrow and cylindrical, and inserted on the sides of the rostrum, nearer the antennary fosset than the orbit; third joint nearly as large and as long as the second; the terminal and articulated stem rather short. External *jaw-feet* presenting nothing remarkable; *sternal plastron* nearly circular. Anterior *feet* generally, in the male, longer and stouter than that of the second pair, the hand or claw always stout and convex, the pincers distant at their base, enlarged at the end, deeply hollowed into a spoon-shape, and terminated by a semicircular trenchant edge. *Feet* of the second pair about once and a quarter as long as the post-frontal portion of the carapace; the succeeding feet gradually shortened; the tarsi short, hooked, and often armed with some points at their inferior surface. *Abdomen* generally formed of seven joints in both sexes; but sometimes only four are to be perceived in young females, the second, third, fourth, and fifth segments being soldered.

M. Milne Edwards remarks that *Mithrax* establishes some connexion between the family of the Oxyrhynchs and that of the Cyclometopes.

Geographical Distribution of the Genus.—The seas of America for the most part, where some of the species attain to a considerable size.

M. Milne Edwards divides the genus into two sections:—the first consisting of those species which have the superior edge of the orbit armed with strong spines; the second, of those which have the superior border of the orbit unarmed. The first of these sections is further subdivided into two subgenera, the first subgenus consisting of those *triangular* species whose four last feet are not spiny; and the second subgenus, of those *transversal* species whose four last feet are armed with spines. The second section contains the third subgenus, consisting of the *depressed* species.

We select, as an example, a species illustrative of the first subgenus, *Mithrax dichotomus.* Size, about two inches; colour, yellowish. *Locality.*—Coasts of the Balearic Islands.



Mithrax dichotomus.

a, under part of the head; *b*, abdomen of the male; *c*, termination of one of the posterior feet.

Paramithrax. (Milne Edwards.)

Establishing, in the opinion of M. Milne Edwards, the passage between *Mithrax* and *Maia*.

General form of the *carapace* very closely approaching that of the triangular *Mithraces*. *Rostrum* formed of two stout horns, and considerably less wide than the front, which, in its turn, has nearly as much extent as the buccal frame. *Orbits* oval-shaped, their upper border arched forwards as in the *Maiæ*, and with three strong spines posteriorly separated by two notches more or less deep; their inferior border widely notched or incomplete. *Eyes* retractile, with slender peduncles, which are rather long and curved, as in the *Maiæ*. The antennary region and antennary pits resembling those of the *Maiæ*. Basilary joint of the external antennæ large and armed with spines, one of which (the external) advances in general beyond the border of the front, and separates the orbit from the insertion of the moveable stem, which is not covered by the front. *External jaw-feet* and *sternum* nearly as in the *Maiæ*. Anterior feet of moderate strength, and terminated by pointed and rounded claws, which are not dentilated as in *Pisa*, nor hollowed into a spoon-shape as in *Mithrax*. The succeeding feet are cylindrical, very little or not at all spiny, and of variable length, according to the species; there are no small horny points at the lower end of the last joint, as in most of the *Mithraces*.

Geographical Distribution of the Genus.—Australasia.

M. Milne Edwards divides *Paramithrax* into two sections:—the first consisting of those species which have the orbits very incomplete below, and whose eyes do not reach to the external angle of the cavities; the second, of those whose orbits have only one notch below, and whose eyes, when turned back, touch the external orbital angle. *Paramithrax Peronii* is an example of the first section, and *P. Gaimardii* of the second.

Maia. (Lamarck.)

This genus was established by the author of the 'Animaux sans Vertèbres,' for the reception of the genera *Inachus* and *Parthenope* of Fabricius, or, in other words, for all the Oxyrhynchs properly so called. More modern authors have cut the Lamarckian genus down to the group formed by the small number of species which may be arranged in close approximation to *Maia Squinado*.

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as in the *Criocarcini*, except
Form of the external *jaw-feet*
the *epistome* is extremely short.
of the second pair hardly longer
on of the carapace; the succeed-
shortened. The *abdomen* of the
even joints.

ution of the Genus.—The only cer-
M. Milne Edwards is the Red

tuberculosa. There are some
even on the carapace. Colour

era. (Latreille.)

mblance to *Pisa*, but differing from
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Carapace very much elongated, and
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d very distant from the orbit. Disposition
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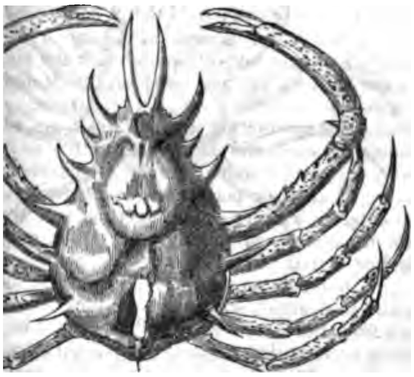

Pericera cornuta (reduced one-fourth).

Stenocinops. (Latreille.)

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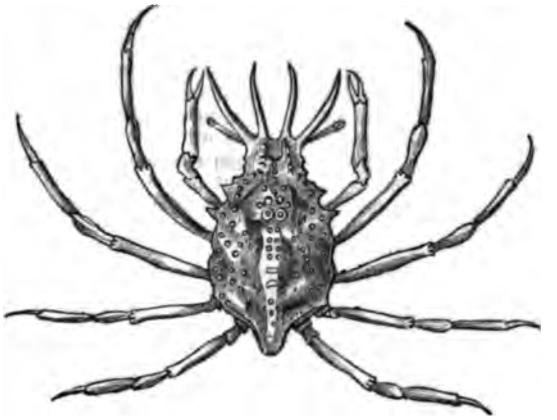
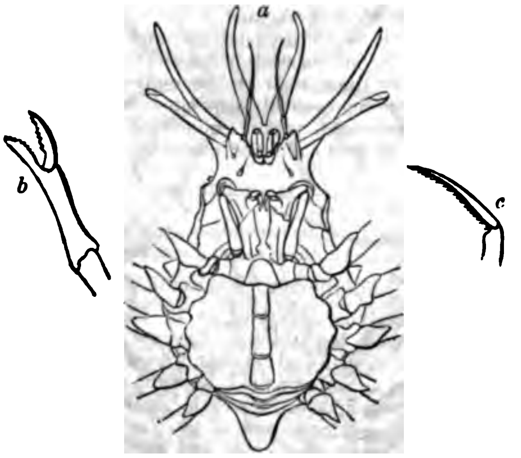
Only one species, *Stenocinops cervicornis* (Latr.), *Cancer cervicornis* (Herbst), is known. Length from about two to three inches.

Locality.—The Isle of France.





Stenocinops cervicornis.

a. Under side in detail; *b*, termination of one of the first pair of feet; *c*, termination of one of the succeeding feet.

Menæthius. (Milne Edwards.)

With much of the habit of *Pisa*, and establishing the passage between that genus and *Halimus*. *Carapace* about once and a half as long as it is wide, very much narrowed anteriorly, and of the form of a triangle rounded at its base. *Rostrum* formed by a large pointed process, which is placed on the median line of the body, and occupies about a third of the total length of the carapace. The anterior angles of the orbits surmounted by a large pointed and horizontal tooth directed forwards; the borders of these cavities without fissures, and exactly surrounding the base of the ocular peduncle, which is short and but little moveable. The disposition of the external *antennæ*, of the external *jaw-feet*, and of the thoracic *feet*, the same as in *Pisa*, except that there exists on the lower surface of the tarsi two rows of horny points. The *abdomen* of the male composed of seven distinct joints; that of the female of five only, of which the penultimate is formed by the soldering of three rings.

Example, *Menæthius Monoceros*. Length about ten lines; rostrum fringed with hairs; colour brownish.

Locality.—The Red Sea and the Indian Ocean.

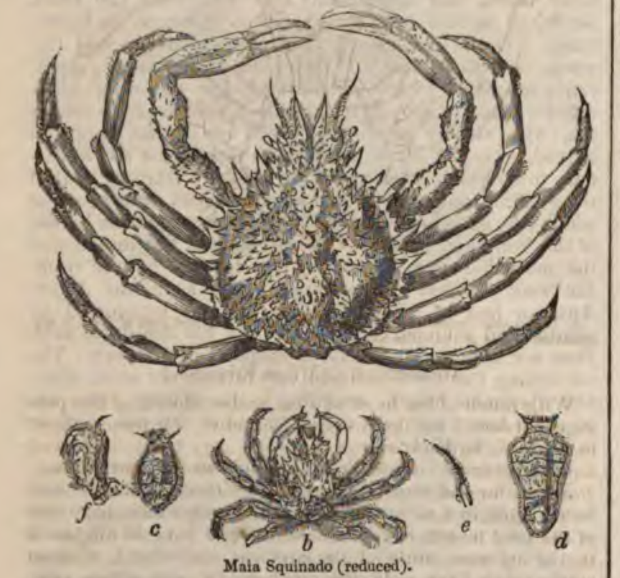
Carapace about a fourth longer than it is wide, and much narrowed anteriorly; its upper surface is rough, with multitudinous tubercles and spines, and the regions are not strongly marked on it; *rostrum* horizontal, and formed of two divergent horns; the latero-anterior border of the carapace armed with strong spines; *orbits* of an oval shape, rather deep, and with their superior border, which is elevated and rounded anteriorly, divided behind by two fissures. Internal *antennæ* exhibiting nothing remarkable, but the portion of the front which separates their fossets or pits is prolonged into a strong curved spine, which is directed downwards. First joint of the external antennæ very large, and constituting more than half of the inferior floor of the orbit, which it only exceeds anteriorly a very little; its extremity is armed with two stout spines, and carries the succeeding joint at its superior and external border, so that the moveable stem of these appendages springs in the internal canthus of the eyes. *Epistome* wider than it is long; *buccal frame* the same. Second joint of the *external jaw-feet* prolonged a good deal, from the internal side. *Sternal plastron* nearly circular, and its median suture, although sufficiently long, only occupying the last thoracic ring. First pair of feet not a great deal shorter than the others, slender, nearly cylindrical, and terminated by a claw, the fingers of which, nearly styliform, are never hollowed into a spoon-shape nor dilated towards the extremity, and present few or no dentilations. Length of the second pair hardly exceeding once and a half the width of the *carapace;* the succeeding feet gradually shorter; their terminating joint is styliform, and presents neither spines nor dentilations on its inferior border. *Abdomen* consisting of seven distinct joints in both sexes.

Geographical Distribution of the Genus.—The seas of Europe.

Example, *Maia Squinado.* Body covered with hooked hairs; length four or five inches; colour reddish.

Locality.—The British Channel, the oceanic coasts of Europe, and the Mediterranean.

This species is often dredged up, and the fishermen sometimes eat it, but its flesh is not much esteemed. It was considered by the antients to be endued with reason, and was by them represented suspended from the neck of Diana of the Ephesians, as an emblem of wisdom. It is also figured on ancient coins and medals.



Maia Squinado (reduced).

b, female, young; *c*, abdomen of female; *d*, abdomen of male; *e*, antenna; *f*, pedipalp.

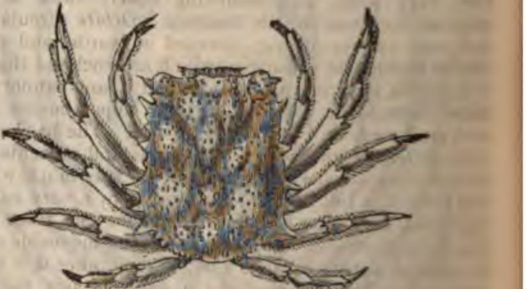
Micippa. (Leach.)

Post-frontal portion of the *carapace* nearly quadrilateral, slightly convex, rounded backwards, and hardly narrowed anteriorly; its fronto-orbital border is straight and very wide, and its lateral borders are armed with spines. *Rostrum* lamellar, and directed vertically downwards so as to form a straight angle with the axis of the body and the epistome. Orbits placed above and on the sides of the rostrum; at their superior border a deep slit; *ocular peduncles* retractile, rather long, narrowed in the middle and prolonged to the extremity of the cornea. The stem of the internal antennæ in bending back remains vertical, instead of becoming horizontal, as in nearly all the other brachyurous crustaceans. The basilary joint of the *external antennæ* very large, and wider in front than it is behind; the second joint of these appendages is inserted against the edge of the rostrum, at a considerable distance from the orbit. The third joint of the *external jaw-feet* is extremely dilated on the external side, and very deeply notched at the point where it articulates with the succeeding piece. *Sternal plastron* nearly circular. *Feet* cylindrical and of moderate length, there being little difference in size and length between the first and succeeding pairs. *Abdomen* consisting of seven distinct joints in both sexes.

Geographical Distribution of the Genus.—The coasts of the Indian Ocean.

Example, *Micippa Philyra.* Length about two inches; colour yellowish.

Locality.—The Indian Ocean and the coasts of the Isle of France.



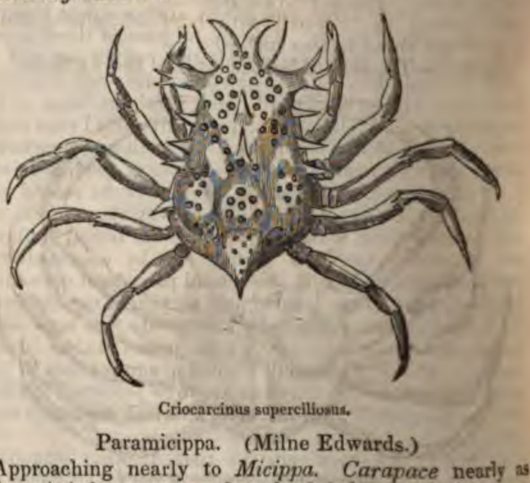
Micippa Philyra.

Criocarcinus. (Guérin.)

The principal characters of this extraordinary genus are found in the disposition of the orbits and of the eyes. The *orbitary cavities* have nearly the form of a long and truncated tube directed outwards; but they do not sheath the eyes as in *Pericera*, for the ophthalmic ring advances nearly to their extremity, and the ocular peduncle, which is long, slender, and like that of *Maia*, is inserted so as to be completely exposed, and to be capable of reflection backwards, and of applying itself throughout its length against the external border of the basilary joint of the external antennæ, a position in which it is concealed under the post-orbital spines of the carapace.

Example, *Criocarcinus superciliosus; Cancer superciliosus* (Herbst). Length eighteen lines.

Locality unknown.



Criocarcinus superciliosus.

Paramicippa. (Milne Edwards.)

Approaching nearly to *Micippa. Carapace* nearly as wide as it is long, *rostrum* bent back below, and the latero-anterior borders armed with teeth. Disposition of the external *antennæ* nearly the same as in *Micippa*, except that the second joint, which is placed on the same level as the upper part of the front, is flattened, enlarged, very short, and triangular or heart-shaped. The disposition of the *eyes* is very different, for they cannot be reflected backwards, and there is no post-foraminal orbitary cavity; their peıoots much beyond the edges of the orbit, and pre- same disposition as in the *Criocarcini*, except are immovable. Form of the external *jaw-feet* as in *Pisa;* but the *epistome* is extremely short. are short, those of the second pair hardly longer post-frontal portion of the carapace; the succeed- are gradually shortened. The *abdomen* of the composed of seven joints.

zphical Distribution of the Genus.—The only cer- ılity stated by M. Milne Edwards is the Red

ɔle, *Paramicippa tuberculosa.* There are some the feet, and even on the carapace. Colour

ty unknown.

Pericera. (Latreille.)

g much resemblance to *Pisa,* but differing from ıs in many characters, and especially in the dispo- the orbits. *Carapace* very much elongated, and ɔss triangular, a little convex and unequal above. horizontal, and formed by two great conical horns. ry wide, and occupying nearly twice as much the base of the rostrum. *Orbits* circular, very l extremely deep, directed outwards, and entirely he ocular peduncles, which are enclosed therein as ıth, scarcely proceed beyond it, and cannot be re- ırwards or backwards; their upper border is very duced, and presents a fissure. The basilary joint *ternal antennæ* is very large, and presents nearly dispositions as in *Micippa,* for it is much wider in n it is behind, and terminates by a very extensive ıl border, which is soldered to the front or the ıe rostrum. The position of the moveable stem of ıal antennæ varies a little; sometimes it is inserted ɔ rostrum, sometimes a little outside the lateral that prolongation, but always very near the an- osset, and very distant from the orbit. Disposition ernal *jaw-feet,* as well as that of the *sternal plas- feet,* and the *abdomen,* nearly the same as in

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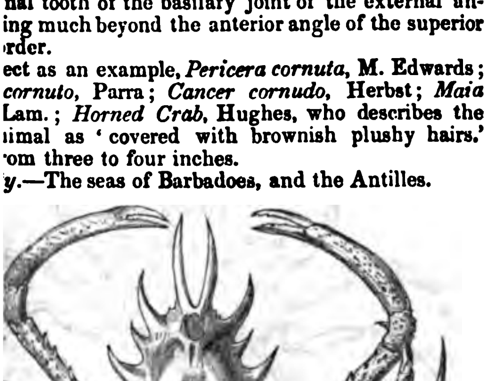

Pericera cornuta (reduced one-fourth).

Stenocinops. (Latreille.)

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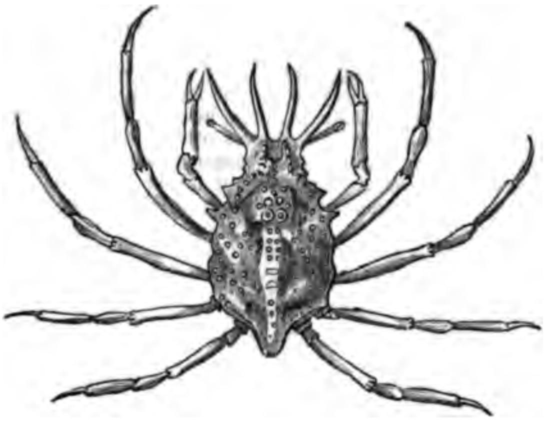
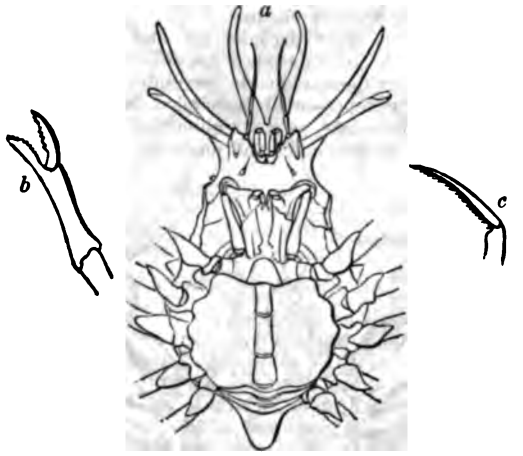
Only one species, *Stenocinops cervicornis* (Latr.), *Cancer cervicornis* (Herbst), is known. Length from about two to three inches.

Locality.—The Isle of France.





Stenocinops cervicornis.

a, Under side in detail; *b,* termination of one of the first pair of feet; *c,* termination of one of the succeeding feet.

Menæthius. (Milne Edwards.)

With much of the habit of *Pisa,* and establishing the passage between that genus and *Halimus. Carapace* about once and a half as long as it is wide, very much narrowed anteriorly, and of the form of a triangle rounded at its base. *Rostrum* formed by a large pointed process, which is placed on the median line of the body, and occupies about a third of the total length of the carapace. The anterior angles of the orbits surmounted by a large pointed and horizontal tooth directed forwards; the borders of these cavities without fissures, and exactly surrounding the base of the ocular peduncle, which is short and but little moveable. The disposition of the external *antennæ,* of the external *jaw-feet,* and of the thoracic *feet,* the same as in *Pisa,* except that there exists on the lower surface of the tarsi two rows of horny points. The *abdomen* of the male composed of seven distinct joints; that of the female of five only, of which the penultimate is formed by the soldering of three rings.

Example, *Menæthius Monoceros.* Length about ten lines; rostrum fringed with hairs; colour brownish.

Locality.—The Red Sea and the Indian Ocean.

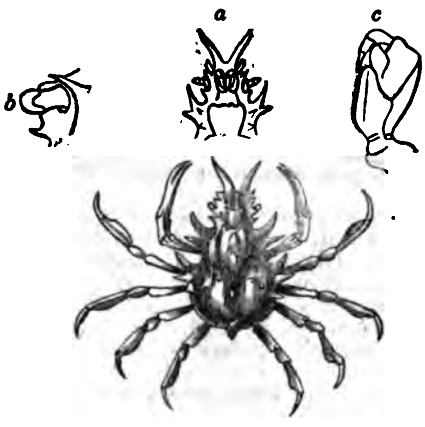
Halimus. (Latreille.)

M. Milne Edwards looks upon this genus as establishing the passage between the Eurypods, the Pisæ, the Menæthii, and the next genus.

Carapace, including the rostrum, about once and a half as long as it is wide, and convex above. *Rostrum* advanced, and formed of two divergent horns; superior orbitary border projecting, and the latero-anterior borders of the carapace nearly always straight, and armed with strong spines. Eyes not retractile, and exceeding considerably the edges of the orbit, which is prolonged backwards with a groove which represents the post-foraminary portion. First joint of the *external antennæ* very long, straight, and nearly of the same width at its extremity as at its base; the insertion of the moveable stem of these appendages not covered by the rostrum. The *epistome* very large, and nearly square. Third joint of the *jaw-feet* strongly dilated outwardly. *Pterygostomian regions* very small. Anterior *feet* slender and of moderate length in the male as well as in the female. The succeeding feet long, slender, and compressed; their penultimate joint enlarged below, and truncated like a subcheliform claw. *Abdomen* of the male composed of seven segments; that of the adult female of five.

Geographical Distribution of the Genus.—The East Indian Ocean.

Example, *Halimus Aries.* Length about an inch.

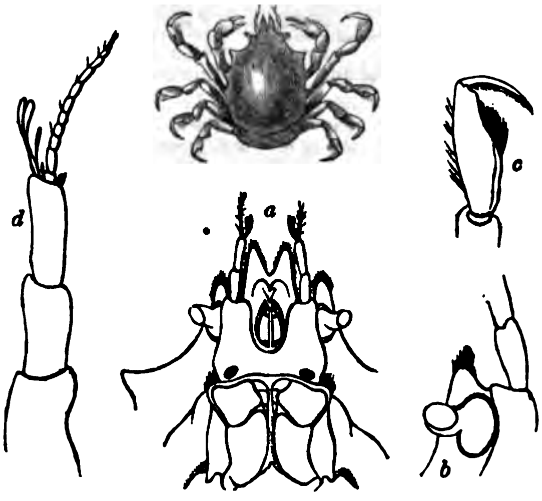


Halimus Aries.

a, head in detail; *b*, eye; *c*, pedipalp.

Acanthonyx. (Latreille.)

Carapace nearly as elongated as in *Halimus*, but less convex and much less spiny. *Rostrum* horizontal and formed of two flattened and divergent horns. *Orbits* circular and occupied entirely by the base of the ocular peduncle, which passes beyond them remarkably. Disposition of the *antennæ*, of the *epistome*, and of the *jaw-feet*, nearly the same as in *Halimus*. *Feet* short and stout; those of the four last pair very much compressed; fifth joint enlarged below, notched near the end with a hairy tooth, against which the finger is bent back in manner of a claw; those of the second pair show this structure most clearly.



Acanthonyx lunulatus.

a, head in detail; *b*, eye; *c*, termination of foot of the second pair; *d*, antenna.

Geographical Distribution of the Genus.—The form is widely spread. Species are recorded from the Mediterranean, from the Antilles, and from the Cape of Good Hope.

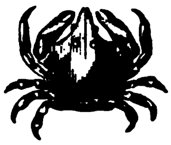
Example, *Acanthonyx lunulatus.* Length about 8 lines; body smooth, with some fasciculi of hairs on the front; colour deep green. *Localities*, the coasts of Provence and the Bay of Naples, where it is found in crevices of the rocks overhung with *algæ*.

Epialtus. (Milne Edwards.)

Establishing in some respects, according to the opinion of M. Milne Edwards, the passage between *Doclea* and *Acanthonyx*, but much more nearly approximated to the latter. *Carapace* between circular and hexagonal, scarcely longer than it is wide, regularly convex and smooth above. *Rostrum* narrow, triangular, and little or not at all divided; latero-anterior borders of the carapace very short, and forming with the lateral borders a very open angle. *Eyes* very short and not projecting much beyond the orbit, which is circular and with entire borders; but the eyes nevertheless appear susceptible of being recurved a little backwards. *Antennary region* very small; moveable stem of the external *antennæ* inserted under the rostrum, at a considerable distance in front of the orbit, and the basilary joint of these appendages nearly triangular and very narrow at its extremity. It would seem to form the whole of the lower orbitary wall. The second joint of these antennæ is a little enlarged and nearly twice as long as the third. *Epistome* small and square; *external jaw-feet* large, and their third joint nearly square, not sensibly enlarged externally, and only a little notched at its anterior and internal angle, where it joins to the succeeding articulation. The *sternal plastron* nearly circular. Anterior *feet* rather strong, and the claws slightly spoon-shaped. The succeeding feet cylindrical, and on their penultimate joint a small setiferous tubercle more or less projecting; their last joint is furnished below with two rows of small spines, and has but little flexibility: the tubercle is only well apparent in the posterior feet. The second pair are much longer than the others. Segments of the abdomen varying from six to seven in the male.

Geographical Distribution of the Genus.—The coasts of Chili, as far as it is yet known.

Example, *Epialtus tuberculatus.* Length three or four lines; colour brownish yellow. *Locality.*—Chili.



Epialtus tuberculatus.

Leucippa. (Milne Edwards.)

M. Milne Edwards sees in *Leucippa* much analogy to *Acanthonyx*, and he is of opinion that the former establishes in some points a passage between the *Maians* and the *Parthenopians.*

Carapace resembling that of *Eurynome*, save that instead of being unequal and beset with spines as in them, its surface is perfectly smooth; its length exceeds its width only a little, its anterior portion is nearly triangular, and its latero-anterior borders are projecting and trenchant. *Rostrum* horizontal, projecting, very wide, and formed of two lamellar horns. *Orbits* incomplete, so that the eye cannot be hid therein completely; the superior border of these cavities is straight, and goes to rejoin the base of the first tooth from the latero-anterior border of the carapace, so as to form a triangular notch; the external edge of the basilary joint of the external *antennæ* constitutes the internal portion of their inferior wall or partition; but backwards and below they are limited by nothing, and it may be said that there is no post-foraminary portion of the orbit. The *eyes* are small and carried on a very short peduncle; when they are folded backwards they only reach a little beyond the transversal line, and they are applied on the angle of the latero-anterior border of the carapace. The first joint of the external *antennæ* is straight throughout its length; the second and the third are completely hidden under the rostrum, and this last is nearly twice as long as that which precedes it. *Epistome* not very much developed. External *jaw-feet* with their third joint very much dilated outwards, and slightly truncated at its anterior and internal angle. *Feet* short, compressed, and surmounted nearly throughout their length by a trenchant crest. *Abdomen* of the female composed of seven segments, and covering the whole of the sternal plastron: that of the male unknown.

Geographical Distribution of the Genus.—This form, as far as is known, belongs to the Pacific Ocean.

The only species known, *Leucippa pentagona*, is about four lines in length; colour pale grey (female).

Leucippa pentagona.

a, under view of the head, magnified.

(*Histoire Nat. des Crustacés*, &c.)

MAIKOV, BASIL IVANOVITCH, a Russian author who gained some distinction by his talent for comic poetry, was born at Jaroslav, in 1725. Although he had received but a very moderate education, a natural aptitude for writing verses and a turn for humourous satire enabled him to distinguish himself by his 'Yelisei, or Bacchus Enraged,' a burlesque poem in five cantos, the hero of which is a *yamshtshik*, or carter, named Yelisei, whom Bacchus takes under his protection. It is chiefly by this production that Maikov is now remembered; but the fiction itself is so extravagant, and the narrative in many parts so confused, as to detract considerably from the pleasure afforded by the humour displayed in many passages. He also wrote two poems in a similar vein: one entitled 'Igrok Lombera, or the L'Hombre Player;' the other, 'The Most Shocking Fall of the Poets;' each of which is in three cantos. His other works consist of two tragedies and several tales and fables. To these last-mentioned productions the epithet 'Moral,' prefixed to them by the author himself, can hardly be said to belong, for one of them at least is most scandalously indecent. There is also considerable grossness in many parts of 'Yelisei.' Maikov died at Moscow in 1778, but the first entire collection of his poems did not appear till 1809, when they were published in one volume, at St. Petersburg.

MAIL (from the French *maille*), strictly 'the mesh of a net,' but applied in a collective view to defensive armour formed of iron rings or round meshes. Boyer, in his French dictionary, translates *maille* 'a little iron ring.' Mail or malle was also the name given to a bag or small sack, at first probably because made of net-work; since applied likewise to the portmantle or portmanteau.

MAIL, COAT OF (also denominated the Hauberk or Habergeon), armour for the body, of which there were two kinds, one called chain-mail, the other plate-mail. Chain-mail consisted of a number of iron rings interlaced, each ring having four others inserted into it, the whole exhibiting a kind of net-work already described, with round meshes. Plate-mail consisted of laminæ of metal-like scales, fastened down to a strong quilted linen or leathern jacket. [ARMOUR.] Compare also Grose's *Milit. Antiq.*, vol. ii.; Meyrick's *Critical Inquiry into Antient Armour*, fol., Lond., 1824; and his *Observations on the Body Armour antiently worn in England*, and *Upon the Lorica Catena of the Romans*, in *Archæologia*, vol. xix., pp. 120-145, 335-352.

MAIM (in law, 'mayhem') is an injury done to the body of a man by forcibly depriving him of the use of some member serviceable in fight, as a means either of defence or offence, and permanently disabling him from offering such an effectual resistance to further attacks upon his person as he otherwise might have done; as if a foot, hand, or finger, or a joint of the foot or hand, be struck off or made crooked or weakened, or if a bone of the head be removed, or a foretooth broken or displaced, or if an eye be beaten out, or if any other bodily injury be inflicted whereby the party is rendered less capable of making a vigorous defence. But destruction of a jaw-tooth, of an ear, or of the nose, or of other members, the loss of which does not interfere with the means of defence or of offence, does not amount to mayhem. The distinction however is by statutory alterations in the law rendered of little importance.

Mayhem was formerly punished by inflicting the same privation upon the offender which he had caused to the party maimed. It was afterwards punishable by fine and imprisonment, as an aggravated trespass. But now, by 7 Wm. IV. and 1 Vict., c. 85, to stab, cut, or wound, if with intent to murder, is a capital felony, and if with intent to main, disfigure, or disable, is a felony punishable by transportation for life, or for not less than 15 years, or by imprisonment not exceeding three years.

Concurrently with these proceedings in the name of the crown, for the purposes of public justice, the party injured is entitled to compensation in the shape of damages, to be recovered in an action of trespass; and where the damages found by the jury are not commensurate to the injury sustained, the court may increase them upon inspection of the mayhem.

MAIMATSHIN, or MAIMAITCHIN. [KIACHTA.]

MAIMBOURG, LOUIS, born in France in 1620, entered the order of Jesuits, and studied theology at Rome. On his return to France he was employed as a preacher. Having published, in 1682, a work in which he defended the principles of the Gallican Church, 'Traité Historique de l'Eglise de Rome,' the pope caused him to be expelled from the order of Jesuits. Louis XIV. on this occasion gave him a pension, and he retired to the abbey of St. Victor at Paris, where he died in 1686. The four propositions which Maimbourg, with the greater part of the French clergy, maintained, are:—1. That the pope has no authority in temporal matters. 2. That the general councils of the church are superior to the pope. 3. That the pope may err in his decisions, which are subject to the approbation of the church. 4. That the rights, usages, and canons established in the Gallican Church cannot be altered by the pope without the consent of the clergy and the state.

Maimbourg wrote several works on church history, the principal of which are: 1. 'Histoire du Pontificat de St. Grégoire;' 2. 'Histoire du Pontificat de St. Léon;' 3. 'Histoire du Calvinisme,' which has been criticised by Bayle and others; 4. 'Histoire de l'Arianisme;' 5. 'Histoire des Iconoclastes;' 6. 'Histoire du Luthéranisme,' in which he defends indulgences in their fullest extent, as remitting not only the temporal penalty, but the penalty hereafter, both to the living and the dead; 7. 'Histoire de la Ligue.'

Maimbourg is often prejudiced and inexact, but his style is attractive; and several of his works are not destitute of merit. Voltaire, no favourable judge, said of him that 'he had been too much praised at first, and too much neglected afterwards.'

MAIMO'NIDES, or more properly MOSES BEN MAIMON, one of the most celebrated of the Jewish Rabbis, was born at Cordova in Spain, about A.D. 1131 or 1133. He studied philosophy and medicine under the celebrated Averroes, an Arabian physician and philosopher; and also paid great attention to mathematics and natural science, as far as they were known at that time. In addition to a knowledge of Hebrew and Arabic, he is also said to have been acquainted with Greek, and to have studied the writings of the most celebrated Grecian philosophers.

In consequence of a violent persecution having arisen against his master Averroes, Maimonides withdrew to Egypt, where he is said to have gained his livelihood at first by working at the trade of a jeweller. His great merits afterwards introduced him to the sultan Alphadel, who appointed him physician to his own household, and treated him with distinguished honour. He died in Egypt at the age of 70.

The learning and abilities of Maimonides have been universally acknowledged both by Jews and Christians, although the independent mode of thinking which characterised most of his writings, as well as his rejection of some of the favourite absurdities of the Rabbis, rendered him an object of suspicion and dislike among many of his contemporaries. The Rabbis of Montpelier in particular attacked his opinions with the greatest vehemence, and burned his writings; but their proceedings were censured by most of the Spanish Rabbis. The controversy continued till about the year 1232, when the celebrated David

Kimchi was chosen by both parties as an arbiter of the dispute. [KIMCHI.]

The most celebrated of the writings of Maimonides are: 1. *Moreh Nevochim*, or 'Teacher of the Perplexed,' originally written in Arabic, and translated into Hebrew by his disciple Samuel Aben Tybbon. This is perhaps the most valuable work of Maimonides; it contains an explanation of difficult passages in the Old Testament, as well as of types, allegories, &c. The original Arabic has not been printed; but the Hebrew translation has been published at various times; the best edition is by Salomon Maimon, Berlin, 1791. The 'Moreh Nevochim' has been also translated into Latin by Justinian, bishop of Nebio, Paris, 1520, and by the younger Buxtorf, Basel, 1629, with a preface, which contains an account of the life of Maimonides. Dr. Townshend has published an English translation of this treatise, under the title of 'The Reasons of the Laws of Moses, from the "More Nevochim" of Maimonides,' London, 1827. 2. *Perush ha-Mishna*, or 'Commentary on the Mishna,' which was also originally written in Arabic, but has been translated into Hebrew by many Rabbis, and has usually been published with editions of the 'Mishna.' Surenhusius, in his edition of the 'Mishna,' Amst., 1698-1703, has given a Latin translation of this work. Part of it was published in the original Arabic by Pococke, Oxford, 1645, under the title of *Porta Mosis*. 3. *Yad Hazakah*, or 'The Strong Hand,' which contains a complete digest of the Hebrew laws. It is written in remarkably good Hebrew. The best edition is that printed at Amsterdam, 1702, 4 vols. fol. 4. *Shelosh Asarah Ikkarim*, or 'The Thirteen Articles of Faith,' printed at Worms, 1529, and Jena, 1540.

Maimonides also wrote several other treatises on different points of the Jewish law, and many works on medical subjects. He also translated, at the command of the sultan of Egypt, the writings of the Arabian physician Avicenna, or Ibn Sina.

Maimonides founded a college at Alexandria for the instruction of his countrymen, in which he delivered lectures on philosophy and the Jewish laws.

MAIN, UPPER AND LOWER. [BAVARIA.]

MAINA, a district of the Peloponnesus, which occupies the south-west part of the antient Laconica, extending along the range of the Taygetus to Cape Matapan. The inhabitants of this mountainous district were never subjugated by the Turks, but lived in a kind of savage independence, often making incursions into and plundering the neighbouring districts occupied by the Turks: some of them also scoured the sea as pirates. Their chief, who was hereditary, was styled Bey, but his authority was much circumscribed by the council of the primati, or heads of the principal families. The number of the Mainiotes has been variously stated, by some as high as 40,000. Thiersch (*De l'Etat actuel de la Grèce*) states the eparchy of Maina to contain about 3000 families; but this includes merely the southernmost part, or rocky peninsula between the Laconian Gulf and that of Coron; but the name of Mainiotes was given in general to all the mountaineers of West Laconica. They are now subjects, though not very docile ones, of the new kingdom of Greece.

MAINE, LE, one of the provinces into which, before the Revolution, France was divided, was bounded on the north by the duchy of Normandie; on the east and south-east by the districts of Chartrain, Dunois, and Vendômois, portions of Orléanais, and by Touraine; on the south by Anjou, and on the west by Bretagne. Its length may be estimated at 113 miles from east to west; its breadth from north to south at about 59: its area may be estimated at 3886 square miles. It was watered in the western part by the Mayenne; and in the central and western parts by the Sarthe and its branches. It was subdivided into Haute (or Upper) Maine in the centre, Bas (or Lower) Maine in the west, and Le Perche in the east. The capitals of these districts were respectively Le Mans, Mayenne, and Mortagne: Le Mans was considered to be the capital of the whole province. Le Maine is now for the most part divided into the departments of Sarthe and Mayenne, except Le Perche, which is for the most part included in the department of Orne. Some small portions are included in the departments of Eure and Eure et Loir.

Le Maine derives its name from the Aulerci Cenomani, one of the Celtic tribes which inhabited it. They possessed the central and eastern parts: the Diablintes (perhaps another division of the Aulerci) occupied the north-western parts; the Arvii, the south-western; the Saii or Essui, a small portion of the north-eastern; and the Carnutes, another small portion of the extreme east. The Aulerci Cenomani were among the nations who filled the north of Italy with a population of Gauls. Le Maine was among the earlier conquests of the Franks, who established here a kingdom, which lost its separate existence when Clovis amalgamated the Frankish tribes under his sway.

Le Maine was early formed into a county. It was ravaged by the Normans, and conquered by William the Bastard, duke of Normandie (A.D. 1063), a little before the conquest of England. The troubles of the province during his government and that of his sons, induced Henry I., his youngest son, to cede the province (A.D. 1100) to Hélie de la Flèche, a rival claimant, on whose death (A.D. 1110) it came to the counts of Anjou. On the accession of Henry, count of Anjou and Maine, to the duchy of Normandie (A.D. 1151), and subsequently to the crown of England as Henry II. (A.D. 1154), Maine again became part of the English possessions in France. On the confiscation of these by Philippe II. Auguste, the county of Maine was granted by that prince (A.D. 1204) to Bérengère or Berengaria, widow of Richard I. of England, on whose death it probably reverted to the crown, and was granted by Louis IX. (Saint Louis), together with the county of Anjou (A.D. 1246), to his brother Charles, count of Provence. Under Philippe VI. de Valois, who had inherited it before he came to the throne of France, it was reunited to the crown; but Philippe, shortly after his accession, invested his son Jéan with the two counties, and when Jéan became king, he bestowed them on his second son Louis, who subsequently became count of Provence and king of Naples, in whose line it continued for some time. In 1440, Réné, who possessed the counties of Lorraine, Provence, Anjou, and Maine, bestowed the last on his brother Charles, who transmitted it to his son: but on the death of the latter (A.D. 1481), the county of Maine was once more reunited to the crown, from which it has never since been permanently alienated.

MAINE ET LOIRE, a department in the west of France, bounded on the north by the department of Mayenne, on the north-east by that of Sarthe, on the east by that of Indre et Loire, on the south-east by that of Vienne, on the south by that of Deux Sèvres, on the south-west by that of Vendée, and on the west by that of Loire Inférieure. The form of the department is irregular; its greatest length is from east by north to west by south, from between Le Lude and Château La Vallière to the junction of the little river Divate with the Loire, 77 miles; the greatest breadth, at right angles to the length, is from the neighbourhood of Pouancé to that of Maulevrier, 60 miles. The area is estimated at 2799 square miles, which is almost equal to the conjoint areas of the English counties of Lancashire and Cheshire. The population in 1831 was 467,871, in 1836 it was 477,270, showing an increase in five years of 9399, or about 2 per cent., and giving 170 or 171 inhabitants to a square mile. In extent of surface and in population, whether regarded as to amount or density, it is considerably above the average of the French departments; but in the last respect far below the English counties with which we have compared it. Angers, the capital, is in 47° 28′ N. lat. and in 0° 33′ W. long., 161 miles from Paris in a direct line, or 178 miles by the road through Chartres and Le Mans.

The department has no mountains, nor are there any very high hills. The high lands which separate the basins of the Vilaine and the Loire occupy a small part of the north-western border, and the southern part is overspread by the prolongations of the heights of Gâtines, which bound the basin of the Loire on the south-west. The surface of the department consists for the most part of low hills covered with vineyards, or of gently undulating plains, divided by ditches and quick hedges, and adorned with clumps of trees, whose foliage gives variety and beauty to the landscape. The eastern side of the department is occupied by the chalk which encircles the Paris basin: a belt of land in the centre, extending across the department, first south-west along the eastern bank of the Sarthe to its junction with the Mayenne, and from thence south-east by Angers, Brissac, and Doué, is occupied by the formations between the chalk and the saliferous sandstone: the western side is occupied by the primitive rocks.

The whole department is included in the basin of the Loire, which river crosses it from east to west. It enters the department just below the junction of the Vienne, and flows westward to Ingrande 53 miles; for 22 miles below Ingrande it separates this department (which extends farther west on the south side of the Loire than it does on the north side) from that of Loire Inférieure. There are numerous islands in this part of the river. The Mayenne, the principal tributary of the Loire, enters the department on the north side, and flows south in a circuitous channel to Angers, a little below which it falls into the Loire: its whole course is about 27 miles. The Sarthe enters the department on the north side, about 12 miles east of the Mayenne, and after a tolerably direct course of 23 miles south-south-west, joins the Mayenne just above Angers. The Loir enters the department also on the north side, but about 12 miles farther east than the Sarthe, and flows south-west, though with one or two considerable bends, about 27 miles into the Sarthe, into which it falls about five miles above its junction with the Mayenne. All these rivers are navigable throughout that part of their course which lies within the department. They have no feeders of any consequence except the Oudon, which enters the department on the north-west, and after receiving the Arraise and the united stream of the Argos and the Verzée, falls into the Mayenne, midway between the border of the department and Angers. Its whole course in this department is about 17 miles, for 10 of which it is navigable. The Aution or Authion enters the department on the east side, 3 or 4 miles from the north bank of the Loire, and has a westward course of 34 miles in this department parallel to that river, into which it falls at Les Ponts-de-Cé near Angers. It receives the Latan and the Couanon. It is not marked in Brué's map of France as navigable, though included in the official statements. All the above tributaries of the Loire join it on the north bank.

South of the Loire are the Thoué or Thouet, with its tributary the Dive; the Laubancy; the Layon, with its tributary the Hyrome; the Evre; and the Divate; which successively fall into the Loire. The Divate, the most westerly of them, separates this department from that of Loire Inférieure. The Thoué, the Dive, and the Layon are given in the official statements as navigable, but only the Thoué is marked as being so in Brué's map. The Sèvre Nantaise skirts the south-west border of the department, and its tributary the Moine waters the south-west part. The statement of the inland navigation of the department is thus given in the 'Statistique de la France,' printed by the French government:—

	Miles.
Loire . .	54
Mayenne . .	30
Sarthe . .	27
Loir . . .	29
Oudon . .	11
Authion . .	26
Thoué . .	11
Dive . . .	9
Layon . .	37
	234

There were (January 1, 1837) nine Routes Royales, or government roads, having an aggregate length of 246 miles, namely, 89 in repair, 144 out of repair, and 13 unfinished. The principal road is that which leads from Paris by Chartres and Le Mans to Angers, and from thence to Nantes. It enters the department between La Flèche (Sarthe) and Durtal, following the right or north-west bank of the Loir; at Durtal it crosses that river and runs south-west to Angers. From Angers it runs west-south-west along the valley of the Loire by St. George's to Ingrande, beyond which it enters the department of Loire Inférieure. Another road from Paris to Angers by Tours enters the department on the east, and follows the north bank of the Loire, through Roziers and St. Mathurin. Roads lead from Angers along the valley of the Mayenne west of that river, by Le Lion d'Angers, to Laval, and by Les Ponts-de-Cé across the Loire, by St. Lambert, Chemille, Trementine, and Chollet, to Bourbon Vendée and Les Sables d'Olonne (Vendée). A road from La Flèche runs south by Baugé and Longué across the Loire to Saumur, from whence one branch continues southward by Montreuil-Belloy to Parthenay and Niort (Deux Sèvres); another runs south-south-west by Doué, Vihiers, Coron, and Vezins to Chollet. There were at the same date twenty-four Routes Departementales (departmental roads), with an aggregate length of 353 miles, of which 143 were in good repair, 34 out of repair, and 176 unfinished. The number of bye-roads and paths was above eight thousand; their aggregate length more than 8500 miles. Few departments would be so well provided with means of communication by land and water, if the roads were kept in good repair.

The soil is in general fertile, and the quantity of waste land is but small. Nearly two-thirds of the department are under the plough. The quantity of corn raised is considerably above the consumption of the department. The exports amount sometimes to more than 500,000 hectolitres, or more than 170,000 quarters. Pulse of all kinds is grown, especially beans and kidney beans, of which 20,000*l.* worth are sent to Nantes and Bordeaux for sea stores. Hemp and an abundance of excellent fruits are raised, especially melons, almonds, and plums. Pears and apples are cultivated, the latter for cider. The vineyards occupy 85,000 to 90,000 acres, and yield on an average nearly 500,000 hectolitres, or above 11,000,000 gallons of wine of fair quality. The best wines are the red wines of Neuillé and Champigné-le-Sec, and the white wines of Varrains, Clos-Morin, Saumur, Rabelais or Rablay, Faye or Foy, and Bonnezeau. The quantity of meadow-land is considerable, about 200,000 acres. A considerable number of horned cattle are reared, and of sheep of a breed crossed with the merinos. The Thibet goat has been introduced. The breed of horses has been improved by means of the royal stud established at Angers. The woods occupy about 150,000 acres, and consist chiefly of oak and beech trees. Game and fish are abundant.

Among the mineral treasures are granite, marble of various qualities, excellent building-stone, sandstone for pavements, roofing slates of excellent quality and great abundance [ANGERS], limestone, iron, and coal. The quantity of coal dug in 1835 was 11,556 tons. There was in 1834 only one iron-work, having one furnace for smelting pig-iron, and six forges for the manufacture of wrought iron Charcoal was the fuel employed.

The department is divided into five arrondissements, as follows:—

		Area in Sq. Miles.	Population in 1831.	1836.	Communes.
Angers,	Central & W.	616	134,538	138,459	88
Baugé,	N.E.	539	81,690	81,025	67
Beaupréau,	S.W.	623	104,947	108,518	75
Saumur,	S.E.	570	89,505	91,159	93
Segré,	N. & N.W.	451	57,191	58,109	61
		2799	467,871	477,270	384

There are thirty-four cantons, or districts, each under a justice of the peace.

In the arrondissement of Angers are, Angers (pop. in 1831, 28,933 for the town, 32,743 for the commune; in 1836, 35,901 for the commune) [ANGERS], on the Mayenne; St. Mathurin, Les Ponts-de-Cé, Saveuières, St. Georges, and Ingrande, on or near the north bank of the Loire; Blaison, Rochefort, and Chalonne, on the south bank of the Loire; and St. Aubin, on the Layon. St. Mathurin is in one of the pleasantest parts of the valley of the Loire, and consists of about 400 houses, the greater part of which are on the north side of the road from Tours to Angers, the opposite side of the road forming a kind of terrace immediately above the bank of the Loire. The town of Les Ponts-de-Cé, formerly written Ponts-de-Sai or Sée, takes its name from a line of bridges and causeways extending nearly two miles in length across the arms of the Loire and the islands encircled by them. The houses on each side the causeway form the town, which comprehends two parishes, forming one commune, with a population of 2490 for the town, or 3665 for the whole commune. The bridges have their foundations of slate, and are in a very dilapidated condition; they do not however present any marks of great antiquity. Near the south end of the bridge, on an island of the Loire, are the ruins of a Roman causeway; and at some distance from the northern end of the bridge, at the confluence of the Loire and the Mayenne, is a large Roman camp, capable of containing 100,000 men, and forming an equilateral triangle, defended on two sides by the rivers and on the third by an entrenchment. Many medals and coins with other antiquities have been dug up here. Ingrande has a large glass-house for the manufacture of bottles; it employs about 500 workmen. Chalonne or Chalonnes (pop. 2289 town, 4969 commune) is in a delightful situation. There are the ruins of an old bridge and castle. The inhabitants are chiefly boatmen and weavers: the latter make serges for home consumption, or handkerchiefs for the merchants of Chollet. Black marble is quarried near the town.

In the arrondissement of Baugé are, Baugé (pop. in 1831, 3433 town, 3553 whole commune; in 1836, 3400 commune) and Beaufort (pop. 3288 town, 5914 commune), on or near the Couanon [BAUGE′; BEAUFORT]; Longué (pop. 1577 town, 4491 commune), and Vernantes, on or near the Latan; Durtal (pop. 3465) on the Loir; Moranne, on the Sarthe; and Jarzé. Durtal or Duretal has the remains of an old castle built by Foulques Nera, count of Anjou, consisting of two towers, having a parapet with machicolations. The other parts of the castle are of later date. There is a good stone bridge of five arches over the Loir.

In the arrondissement of Beaupréau are, Beaupréau (pop. in 1831, 3207; in 1836, 3288) [BEAUPREAU]; Le May (pop. 3315), and Montrevault, on the Evre; Jallais (pop. 3163) on a small feeder of the Evre; St. Florent, on the south bank of the Loire; Maulevrier, La Tessouale, Chollet (pop. 4657 town, 7345 whole commune) [CHOLLET], and Montfaucon, on or near the Moine; Greslé, not far from Beaupréau; Chemillé (pop. 3694) on the Hyrome; La Jumellière, Trementine, Tour Landry, and Vezins. Handkerchiefs, linens, and woollens are manufactured at Jallais, St. Florent, Chemillé, Trementine, and Vezins. Le May was destroyed in the Vendéan war, but has been restored. La Tessouale has a considerable establishment for bleaching linen.

In the arrondissement of Saumur are, Saumur (pop. in 1831, 9977 town, 10,652 whole commune; in 1836, 11,925 commune) [SAUMUR]; Montsoreau, and Fontevrault on or near the south bank of the Loire; Roziers, on the north bank; Brissac on the Loubancy; Passavant, Neuil, Les Verches, Doué (pop. 2479), Martigné, Chavaignes, Thouarcé, Rablay or Rabelais, and St. Lambert, all on or near the Layon; Montreuil-Belloy (pop. 1812 town, 1907 whole commune); Coudray, and Puy Notre-Dame, on or near the Thoué; Vihiers, Coron, La Salle, and Gonnord. In the old abbey of Fontevrault, Henry II. and Richard I., kings of England, were buried. Doué has some remains of an old palace of King Dagobert; the ruins of what some have regarded as a Roman amphitheatre hollowed out of a calcareous rock, others as the ruins of an old palace of the kings of Aquitaine; a handsome fountain, and in the neighbourhood some extensive caverns. On the south bank of the Loire below Saumur are the entrenchments, in good preservation, of a camp supposed to be Roman, forming a vast but irregular polygon approaching to an oval. Fragments of Roman pottery and medals of different emperors, from Augustus to the Antonines, have been dug up in this neighbourhood, and round the camp are many vestiges of tombs. At Gennes on the south bank of the Loire, a little lower down, are some other Roman antiquities, and especially the ruins of an aqueduct.

In the arrondissement of Segré are, Segré and Le Lion d'Angers, on the Oudon; Pouancé, near the source of the Verzée; Candé, on the Erdre, a stream which belongs chiefly to the department of Loire Inférieure; and Châteauneuf, on the Sarthe. Segré is a small place, consisting of a few crooked streets or rather lanes, in a situation out of the way of any great thoroughfare, and from the badness of the roads scarcely accessible. The population of the town is probably little more than 800; that of the whole commune was, in 1836, only 2130. Le Lion d'Angers is agreeably situated on the right bank of the Oudon, which is here navigable, a little above its junction with the Sarthe. It is a well built town, favourably situated on the road from Laval to Angers, with a population probably of 2500. Pouancé has some iron-works, with a population probably of about 2000.

The population, where not otherwise specified, is that of the whole commune, and from the returns of 1831.

The manufactures of the department comprehend sail-cloth, handkerchiefs of various colours and of different qualities, coarse linens, and other linens called 'cholettes,' coarse woollen cloths, and woollen stuffs, cotton-yarn, paper, leather, and wax candles. There are also mills or presses for walnut, linseed, and other oils. Trade is carried on in corn, trefoil-seed, dried pulse, wine, brandy, vinegar, paper, cattle, slate, marble, and coal.

The department constitutes the diocese of Angers, the bishop of which is a suffragan of the archbishop of Tours. It is in the jurisdiction of the Cour Royale and the circuit of the Académie Universitaire of Angers, and in the fourth military division, the head-quarters of which are at Tours. It returns seven members to the Chamber of Deputies.

In respect of education this department is very backward: of every hundred young men enrolled in the military census of 1828-29 only twenty-three could read and write; the average of France being thirty-nine.

This department originally formed part of the territory of the Andecavi or Andes, north of the Loire; and of the Pictones, south of that river. In the subdivision of Roman Gaul the former was included in Lugdunensis Tertia, the latter in Aquitania Secunda. The chief town of the Andes was called at first Juliomagus; afterwards, from the name of the people, Andes or Andecavi, the modern Angers. Combaristum, now Combrée, a village between Segré and Pouancé, and Robrica, probably the bridges of Longué on the Latan, were towns of the Andecavi. In the middle ages, and up to the time of the Revolution, the department constituted the greater part of the province of Anjou.

MAINE is the most northern of the United States of North America, being bounded on the south-west and west by New Hampshire, on the south by the Atlantic Sea, on the east by the British colony of New Brunswick, and on the north and north-west by Canada. The United States claim as an appurtenance of Maine all the extensive country traversed by the St. John river and its tributaries west of the boundary-line of New Brunswick (67° 50′ W. long.), which is considered by the British as belonging to Canada. This disputed tract lies between 46° and 48° N. lat., and between 67° 50′ and 70° 30′ W. long. Exclusive of this tract, the state of Maine extends from 43° 5′ to 46° 30′ N. lat., and between 67° and 71° W. long. Its greatest length, from south-south-west to north-north-east, is about 270 miles; and its greatest width, from east to west, about 180 miles. Its surface may be estimated at about 22,000 square miles, or between 3000 and 4000 square miles less than the area of Ireland.

Coast, Surface, and Soil.—The coast-line extends in a straight line 236 miles. The southern portion, as far north as Casco Bay, is rather high, but comparatively free from rocks and islands. Casco Bay extends from south-west to north-east 20 miles, with a mean width of five miles, and is landlocked by a chain of islands. So far the coast trends from south-south-west to north-north-east. Between Casco Bay and Penobscot Bay the coast of the mainland runs nearly west and east; but numerous long peninsulas stretch out from it southward into the sea, and are divided from each other by narrow and deep indentations, which form excellent harbours. These bays contain numerous small islands. Penobscot Bay extends from St. George's Point (44° N. lat) and the Fox Islands, thirty miles northward, to the mouth of the Penobscot river, nearly in a northern direction. It contains numerous wooded islands, some of which are considerable, as Long Island, which is fifteen miles in length and from two to three in breadth, Fox, Deer, and Haut islands. The remainder of the coast-line, from Penobscot Bay to Passamaquoddy Bay, resembles the coast west of Penobscot Bay, consisting of an alternation of promontories and indentations; but the former are commonly wider, and the inlets do not run so deep into the mainland. The most extensive bays are Frenchman's Bay and Machias Bay. Frenchman's Bay is formed on the west side by the extensive island called Mount Desert Island. The approach to this coast, which runs from the south of west to the north of east, is also rendered difficult by numerous rocks and small islands. Though the frost along this shore is very intense in winter, and the numerous islands favour the formation of ice, the harbours are commonly open all the year round, the strength of the tide, which rises from between 24 to 40 feet, preventing their being closed up. The country rises gradually from the shore, but rather rapidly, which is proved by the tide entering the rivers only a few miles, especially towards the south. The surface of the state is mostly hilly, but it is only in the north-western and northern districts that the hills rise to the height of mountains. The mountain-region may be considered as divided from the hilly country by a line beginning on the south on the banks of the Androscoggin river, at the mouth of Swift river (70° 30′ W. long), and running north-north-east towards the southern extremity of Moose-Head Lake, from which point it extends east to the place where the west or main branch of the Penobscot river unites with the Matawamkeag river

East of this branch of the Penobscot the mountains recede northwards to about 46° N. lat. The region to the west and north of this line is full of high hills and mountains, of which the highest, Mount Kathadino, rises to more than 5330 feet. These hills, though mostly isolated, occupy a considerable surface, perhaps one-fourth of the region, and about as much is occupied by the lakes. The lowest part of this region is probably from 600 to 700 feet above the surface of the sea; and few, if any, settlements have been formed in it, except at the southern extremity, in the valley of the Androscoggin, where the hills are of moderate elevation. This region occupies more than one-fifth of the area of the state.

The remainder of the state is occupied by the hilly region, which is well drained by numerous rivers with a rapid course. Swamps are of rare occurrence in this part and of moderate extent, except along the banks of the Matawamkeag, where they occupy a space fifty miles in length. Along the sea-coast, and from ten to twenty miles inland, the soil is of moderate fertility, and frequently intersected with sandy and sterile tracts; but beyond this region the soil improves, and produces plentiful crops of grain, flax, and hemp.

Rivers and Lakes.—The rivers in the southern district have a short course. The principal are the Piscataqua [New Hampshire], the Saco, and the Presumscot, or Casco. The two latter rise on the southern and western declivity of the White Mountains in New Hampshire, the Saco running about 90 and the Presumscot about 60 miles. The latter traverses a large lake called Sebago Pond, and falls into Casco Bay, a short distance north of Portland.

East of Casco Bay is a deep indentation which receives two considerable rivers, the Androscoggin [Androscoggin] and the Kennebeck. The Kennebeck rises in several branches on the eastern declivity of the mountain-range which separates Maine from Canada: these branches, some of which have a course of 40 miles, unite in Moose-Head Lake, a sheet of water about 30 miles long from north to south, with a breadth varying from five to 20 miles. From the south-western side of this lake the Kennebeck issues in a large stream, and the general direction of the remainder of its course is to the south, but with considerable deviations to the west and east, until it reaches the mouth of the Androscoggin, after a course of about 180 miles. Though its course is obstructed by falls and shoals, like that of the Androscoggin, it is of great importance in the transportation of lumber. The tide ascends to Augusta, 70 miles from the open sea. Kennebeck Bay, in which the Androscoggin and the Kennebeck unite, stretches more than 20 miles farther south, being formed by the long peninsula of Phippsbury on the west, and by numerous islands on the east.

The upper branches of Penobscot river are numerous. All the waters which descend from the southern declivity of the high land which forms the southern border of the St. John's river, between 68° and 70° W. long., flow down to the Penobscot. The principal branch is the western, which is formed by several mountain-streams uniting in Chesuncook Lake, from the southern extremity of which it issues with an eastern course. Skirting the southern declivity of Mount Kathadino, it enters Bamedumpcok Lake, and after leaving the lake unites with the north branch and the Matawamkeag, two large rivers which come from the north. At the point of its junction with these two rivers it turns by degrees from an east-south-eastern to a south-western course, in which direction it continues to its junction with the Piscataquis river, a large stream which falls into it from the west. The remainder of its course is a little to the west of south, and it falls into Penobscot Bay after a course of 215 miles, the bay included. The tides come up to Bangor, 30 miles from the bay, and 60 miles from the open sea. Penobscot river is more navigable than the other rivers of Maine, as no obstruction occurs for 20 miles above Bangor, except its rapid current, and it is much used for the transport of lumber.

From Penobscot Bay to that of Passamaquoddy, a distance of 100 miles along the margin of the ocean, no large river empties itself into the sea. The last remarkable river is the St. Croix, or Scodie, which forms the boundary-line in this part between the United States of North America and the British colony of New Brunswick. Its farthest sources are a number of lakes, curving from north to east, and extending in length about 40 miles; they are known by the name of Grand or Chiputnaticook Lake. The river issuing from the lake, called also Chiputnaticook, runs southward until it unites with the outlet of another series of lakes called the Scodie lakes. Hence its course is to the south-east, but with some considerable bends. It enters Passamaquoddy Bay after a course of about 100 miles. Passamaquoddy Bay is of a very irregular form, extending upwards of 20 miles from the mouth of the Scodie river to Quoddy Point; on the side of Maine it forms a bay of considerable extent, called Kopscook Bay.

Climate.—The winter is very severe. From the 1st of November to the 1st of April the ground is covered with snow, and the rivers and lakes with ice. The summer on the sea-shore is very hot. The thermometer frequently rises to 90°, and even 96°, and the weather is subject to sudden and great changes. Drought is frequent. The mean temperature is about 42°, or about eight degrees less than that of London. In the year the thermometer ranges 115°; between 96° above and 19° below zero. In the interior of the hilly region the weather, though not so warm, is much more regular. Little is known of the climate of the mountain region. The climate all over the state is healthy; but perhaps the swampy district on the north-east must be excepted.

Productions.—A very dense forest covered Maine in its natural state, and still spreads over the greatest part of it, the settlements being yet restricted to a comparatively narrow zone along the sea-coast. These forests, consisting principally of white pine, spruce, maple, beech, birch, white and grey oak, constitute the principal wealth of the state; timber being its staple. The cultivated fields do not occupy one-twentieth part of the surface. Indian corn, which constitutes the principal food of the inhabitants, thrives well as far north as the valley of the Lower Penobscot river, but farther north it does not ripen. Other articles cultivated in this state are wheat, rye, barley, oats, peas, hemp, and flax. The fruit-trees of northern Europe thrive very well, especially pears and apples, as well as most of our vegetables.

Cattle and hogs are numerous, and afford articles of exportation. Deer were formerly abundant; wolves, bears, beavers, foxes, and squirrels are still common. The sea abounds in fish, especially cod; and the rivers and lakes are full of fish, especially salmon · large trout are common in the lakes in the interior.

Maine, so far as it has yet been explored, is not rich in minerals, but iron-ore occurs in several places.

Inhabitants.—The population amounted, in 1820, to 297,839, but had increased in 1830 to 398,460; which gives about 18 individuals to a square mile. More than one half of that number is occupied in the forests, cutting the timber, and preparing other articles for exportation, as potash, pitch, &c. Many families along the sea-coast obtain their subsistence by fishing. The inhabitants manufacture coarse cloth and farming utensils; and on several of the rivers there are numerous saw-mills to prepare the timber for the market, which is floated down the rivers.

In the northern part there are still some few natives, who live mostly on the produce of the chase and of their fishery in the lakes. Their numbers seem not to exceed one thousand. The most numerous are the Penobscots, who occupy the upper and part of the central valley of the Penobscot river, in which fish abounds.

Political Geography.—Maine is divided into ten counties and 300 'towns,' a term which is equivalent to townships. The capital is Portland, situated on a promontory in Casco Bay, south of the mouth of Presumscot river. It has a large and safe harbour, which is seldom frozen over. Many vessels are built here, and it carries on a considerable foreign trade. In 1800 its population hardly exceeded 1000 souls, and in 1830 it exceeded 10,000. Along the coast are several towns with good harbours. South of Portland is Arundel with 2500, Wells with 1500, and York with 5000 inhabitants. Falmouth with 4000, Brunswick on the Androscoggin, with 2700, Kennebeck with 2500, Waldonborough with 2200, and Thomaston on the Penobscot Bay, with 3000 inhabitants, are thriving places on the coast north of Portland. At the last-mentioned places many vessels are built. On Passamaquoddy Bay is Lubeck, a town founded in 1815, and having already a population exceeding 1500. In the interior are also a few towns in the southern and most populous districts; as Berwick on the Piscataqua, with 5000, Paris with 2000, and Augusta on the Kennebeck, with 2000 inhabitants.

Bowdoin College, at Brunswick, on the banks of the Androscoggin, 26 miles from Portland, was incorporated in 1796. It is well endowed and has a good library. A medical school, in connection with the college, was established in 1820. There is also a college, founded by the Baptists in 1820, at Waterville on the west branch of the Kennebeck: and there are theological institutions at Bangor and at Readfield. The Gardiner Lyceum, at Gardiner, was established 'for the purpose of giving to farmers and mechanics such a scientific education as may enable them to become skilful in their professions.' Every town is by law required to raise annually, for the support of common schools, a sum equal at least to 40 cents for each person in the town, and to distribute this sum among the several schools or districts, in proportion to the number of scholars in each. A sum raised by a tax on banks is also appropriated to the support of the schools.

Commerce.—The exports consist chiefly of the produce of the forests, as timber, lumber, boards, and potash, and of dried fish, beef, pork, and grain. From the 1st of October, 1832, to 30th of September, 1833, their value amounted to 989,187 dollars; foreign produce exported from the harbours, to the amount of 30,644 dollars, is to be added to this amount, making a total of 1,019,831. The imports amounted in the same year to 1,380,308 dollars, and consisted mostly of manufactured articles from Europe, and salt, iron, and colonial produce from the West Indies, especially Cuba. This state possesses a larger amount of shipping than any other state in the Union except Massachusetts and New York.

History.—It appears that Maine was discovered by one of the Cabots in 1497. It was afterwards visited by the French, who called the southern part, west of the Kennebeck river, Maine, and the eastern part Acadie. In the beginning of the 17th century the English attempted to make some settlements in the southern district, and succeeded about 1635. The first charter was proprietory, and granted in 1639 to Sir Ferdinand Gorges; but in 1652 Maine was united to Massachusetts, under the title of the county of Yorkshire. In 1676 Massachusetts bought the country from the family of the Gorges, and from that time it remained annexed to that state, but thrived slowly, on account of the eternal disputes between the English and French, until in 1712 England obtained its full possession by the peace of Utrecht. Massachusetts opposed the attempts of the inhabitants to separate Maine and Massachusetts; but in 1819 it gave permission to the freemen of Maine to decide this important question, and the majority of votes being in favour of a separation, a constitution was formed and adopted, and in 1820 Maine became an independent member of the Union.

The legislative body consists of a Senate and House of Representatives, chosen annually by all the male citizens of 21 years of age and upwards. The executive is in the hands of a governor, who is chosen annually. Maine sends two members to the Senate, and seven to the House of Representatives at Washington.

(Darby's *View of the United States;* Warden's *Account of the United States of North America;* Pitkin's *Statistical View of the Commerce of the United States of America.*)

MAINIOTES. [Maina.]

MAINTENO'N, FRANCOISE D'AUBIGNE′, Marquise de, was born at Niort in 1635. Her father, Constans d'Aubigné, son of the friend of Henri IV. [Aubigne′, Theodore Agrippa d'], was a man of profligate character. He was in prison at Niort at the time of the birth of his daughter; he afterwards went, with his wife and child, to the West Indies, where he died in 1645. His wife and daughter returned to France in a state of destitution, and Mademoiselle d'Aubigné was brought up by an aunt, and educated in the Calvinist communion, which was that of her paternal relatives. After her mother's death, her godmother, Madame de Neuillant, took her into her house, and obliged her to become a Catholic. Her situation however at Madame de Neuillant's became so unpleasant and humiliating, that she was glad to leave it by marrying Scarron, the comic poet, a man witty but old, infirm, and deformed, who felt for her the interest of compassion. Scarron's house was frequented by fashionable company, among whom Madame Scarron, by her pleasing conversation and address, made several friends. When Scarron died, in 1660, his widow was left poor; but some of her friends recommended her to Madame de Montespan, the mistress of Louis XIV., as governess to her children by the king. She thus became known to Louis, who gradually conceived great esteem for her, especially for the care which she bestowed on the Duke of Maine, one of his sons. The king made her a present of 100,000 livres, with which she purchased the estate of Maintenon. Madame de Montespan's temper was not one of the mildest, and the governess had much to endure from the imperious favourite. Louis himself was often obliged to interfere to restore peace. By degrees the king, who had grown tired of Madame de Montespan, became more strongly attached to Madame Scarron, whose conversation interested and instructed him. She had learnt, in the school of adversity, great forbearance and much tact. The king at length conferred on her the title of Marchioness of Maintenon. The queen consort of Louis was now dead; Louis was no longer young, and he felt the want of an intellectual companion and friend, to whom he could confide his thoughts. Having consulted his confessor, Father La Chaise, the latter advised a private marriage; and in 1685 Louis, who was then forty-seven years of age, was secretly married to Madame de Maintenon, who was fifty years old, by the archbishop of Paris, in presence of the Père La Chaise and two more witnesses. The marriage was always kept secret, and Madame de Maintenon herself never avowed it. Louis however lived openly with her, visited her several times a day, received his ministers in her apartments, and sometimes in their presence asked her advice upon state affairs. Without appearing to seek any political power, but rather professing to shun it, she undoubtedly exercised great influence over the king in his latter years; the choice of ministers and generals was ascribed to her by common report, and she was accused of many faults committed by the cabinet. But it would be very difficult to discriminate between those acts in which she really had a share, and those in which her influence was only supposed. Madame de Maintenon has been unjustly dealt with by many writers, and by St. Simon among the rest. She was ambitious, but not interested, arrogant, or vain; she was fond of religious discussions, and she exerted considerable power over the conscience of Louis, but she complained that 'she could never make him understand that humility was a Christian virtue.' Madame de Maintenon is still favourably remembered as the founder of the institution or school of Saint Cyr, for the education of poor girls of good families. In the latter years of Louis's life she was made unhappy by his fretful and querulous temper, and the fits of passion to which he was subject. In one of her letters she complains that 'she was obliged to please and amuse a man who would not be pleased or amused.' After the death of the king she retired to Saint Cyr, where she died in 1719.

(*Lettres de Madame de Maintenon*, 6 vols. 12mo., Paris, 1812; *Lettres inédites de Madame de Maintenon*, Paris, 1826; Lemontey, *Essai sur l'Etablissement Monarchique de Louis XIV., Pièces Justificatives, No. V., Observations sur le Mariage de Louis XIV. et de Madame de Maintenon*)

MAINTENANCE is defined to be when a man maintains a suit or quarrel to the disturbance or hindrance of right; and if he who maintains another is to have by agreement part of the land or debt, &c. in suit, it is called Champerty. Maintenance was an offence at common law, and has also been the subject of several statutes. By the 32 Hen. VIII., c. 9, no person shall bargain, buy or sell, or by any means obtain any pretensed rights or titles to any lands, unless he who bargains or sells, or his ancestors, or they by whom he claims the same, have been in possession thereof, or of the reversion or remainder thereof, or taken the rents and profits thereof, by the space of a year next before the bargain or sale, on pain of the seller forfeiting the whole value of the lands so bargained or sold, and the buyer, knowing the same, also forfeiting the value of such lands. The professed object of the statute was to prevent the inquietness, oppression, and vexation which the preamble mentions as the consequence of the buying of titles and pretended rights of persons not being in possession of the lands sold.

A man may assign his interest in a debt after he has instituted a suit for its recovery, and such assignment of itself is not maintenance. But if the assignment be made on condition that the assignee prosecute the suit, or if the assignee give the assignor any indemnity against the costs of the suit, already incurred or to be incurred, this makes it maintenance.

(Comyn's *Digest*, 'Maintenance.')

MAINZ, or MENTZ, or in French *Mayence*, the Roman Magontiacum, or Moguntiacum, is the capital of the province of Rheinhessen in the grand-duchy of Hesse-Darmstadt. It is situated in one of the most beautiful and fertile parts of Germany, on the left bank of the Rhine, a little below the junction of the Maine with that river, on the slope of a hill, and it also occupies a long slip of land on the banks of the river: 50° N. lat. and 8° 11′ E. long. Being connected, by a bridge over the Rhine, with the strongly fortified village of Kastel, or Kassel, Mainz is one of the strongest fortresses in Europe, and a chief bulwark of Germany against France. The extent of the works, which were much enlarged by the French while the city was in their possession, including the work called the Weissenauer Schanze, but exclusive of Kastel and of the small redoubt, is two leagues and a half. Among the principal works are the citadel, with the Eichelstein, and that called the Hauptstein, an extremely strong work projecting beyond all the rest, on an eminence called the Linsenberg. Kastel, which is united with Mainz as an outwork, has very extensive fortifications, which consist of four strong forts besides the strongly fortified island of Petersau, including which latter the works are of greater extent than even those of Mainz itself. The inner works consist of 14 principal and 13 smaller bastions. On the land side there are four great gates with double drawbridges, and toward the river several gates. The Rhine runs from south to north, and the Maine from east to west. About a mile above the junction of the two rivers is the village of Kostheim on the Maine, and a little farther up a bridge of boats, defended by a strong tête-de-pont. On the last settlement of the affairs of Germany by the Congress of Vienna, Mainz was assigned to the grand-duke of Hesse-Darmstadt, but it was decided that, as a fortress, it should belong to the German Confederation, with a garrison of Austrian, Prussian, and Hessian troops. This garrison in time of peace consists of 6000 men. The military governor, who retains his post five years, is alternately an Austrian and a Prussian general. It has been objected to this great fortress, that it is too extensive, as it requires for its defence a garrison of 30,000 men.

Mainz is on the whole an old-fashioned and ill-built town. The streets, with three or four exceptions, are narrow, crooked, and gloomy, though there are many handsome private buildings and some fine public edifices. Of the 27 squares and market-places the principal is the Parade, which is surrounded with avenues of trees. Of the 11 churches, of which only one is for the Protestants, the most remarkable are the cathedral, the church of St. Ignatius, which is considered a model of beautiful ecclesiastical architecture, St. Peter's church, and St. Stephen's. The cathedral, founded in the twelfth century, has frequently suffered by fire. It is 350 feet long, 140 wide, and has 14 altars and 20 chapels. It was much injured in the siege by the French in 1793, and under the government of Napoleon it was intended to pull it down, but it has since been gradually repaired. Nothing however remains of the great treasures which it formerly possessed, or of its library, and even many of the fine monuments have been destroyed. Of the public edifices, we may mention the magnificent grand-ducal palace (formerly the house of the Teutonic order), the arsenal, the palaces of the commandant and of the vice-governor, the episcopal palace, the new theatre, &c. A gymnasium has taken the place of the former university, and there are several schools. The city library consists of above 90,000 volumes, and in the same building there are cabinets of medals, and of natural history, a collection of philosophical and mechanical instruments, a gallery of pictures, and a collection of Roman antiquities, comprising 27 altars and votive tablets, and above 60 legionary stones, all found in its vicinity. The Eichelstein in the citadel is supposed to be a monument in honour of Drusus Germanicus, brother of the emperor Tiberius. Near the village of Zahlbach are the remains of an aqueduct said to have been built by the same Drusus. There are pleasant walks on the Rhine; the environs are very beautiful and the prospects over the surrounding country magnificent. The city has few manufactures; but the trade in wine is considerable.

The history of Mainz is remarkable and interesting. Its origin is supposed to have been under the Mediomatrici, who inhabited the left bank of the Rhine, and whose dominion ended in the year 72 B.C. In 13 B.C. Drusus founded the fortress of Magontiacum, on the site on which Kastel now stands. The town which sprung up near it did not extend, under the Romans, to the Rhine. It was destroyed by the Vandals in 406, and lay in ruins for some centuries, till it was rebuilt by the kings of the Franks. A new and brilliant epoch in its history commenced with Boniface (Bonifacius), the apostle of the Germans, who was the first bishop. Some however affirm that Mainz has had 114 bishops and archbishops, from Crescens, who they say was a disciple of St. Paul's, and suffered martyrdom, A.D. 103, to Frederick Charles von Erthal. In 1798 Mainz became the capital of the French department of Mont Tonnère; in 1816 it was ceded to the grand-duke of Hesse. Among the remarkable men born at Mainz are the Minnesänger Frauenlob, and Gutenberg the inventor or improver of the art of printing, in honour of whom one of the squares in the city is named, and contains a statue erected at the expense of the Cassino club. The population of Mainz is 32,000, of whom about 2600 are Protestants, 1700 Jews, and the remainder Roman Catholics.

(M. K. Curtius, *Geschichte und Statistik von Hessen;* Werner, *Der Dom von Mainz*, and *Schicksale der Stadt Mainz, &c.;* Hassel, Stein, Cannabich, &c.)

MAIRE, JAMES LE, was the son of a merchant established at Egmont, near Alkmaar, and born about 1590. As the Dutch East India Company, which had been formed about that time, had obtained a declaration from the states-general, by which every Dutch vessel not belonging to the company was prohibited from doubling the Cape of Good Hope, some private merchants in the towns of Alkmaar and Hoorn formed a joint-stock company for the purpose of trying to effect a passage to the East Indies without doubling the Cape. Among these was Isaac Le Maire, the father of James. Two vessels were equipped for sea; the command of them was given to Cornelius Schooten, an experienced navigator, and James Le Maire was sent with him as the commissioner of the company. They set sail in June, 1615, and having passed the entrance of the Strait of Magalhaens in the following January, they continued their course southward, in the hope of finding a less difficult route to the Pacific than that through the Strait of Magalhaens. They discovered the strait between Staaten Land and Terra del Fuego on the 24th of January, and gave it the name of Le Maire. In a few days they doubled Cape Horn, being the first navigators who accomplished this undertaking. In traversing the Pacific from the east to the west, they sailed through a part of it, where only a few scattered islands occur. At last they arrived on the northern shores of New Guinea or Papua, where an island near a cape called Good Hope was named after Schooten. After visiting Gilolo, one of the Moluccas, they proceeded to Batavia, then called Jaccatra. From Batavia they sailed for Europe, in a vessel belonging to the East India Company, during which voyage James Le Maire died, the 31st of December, 1616.

MAIRE, LE, STRAITS OF, lie in the Southern Atlantic Ocean, on the eastern shores of Tierra del Fuego, between 55° and 55° 30′ S. lat., and are traversed nearly in the middle by the meridian of 65° W. long. They are formed on the east by the western extremity of the island of Staaten Land, and on the west by the coast of King Charles South-land, along which they extend between Cape S. Diego and Cape Good Success. These straits, which are situated in the route of vessels which intend to double Cape Horn, are about 20 miles in length and width. They are free from rocks and shoals, but still some difficulties are encountered in traversing them from the north, on account of the prevalence of western and south-western winds, and a strong current, which always sets through them from the south. They were first traversed by the Dutchmen Le Maire and Schooten in 1616, from the former of whom they received their name.

MAISTRE, A. and L. [PORT ROYAL.]

MAITLAND, SIR RICHARD, of Lethington, son of William Maitland of Lethington and Thirlstane, by his wife Martha, daughter of George, second lord Seaton, was born in the year 1496. Having completed his grammar education, he proceeded to France, at that time the common resort of his youthful countrymen, particularly for the study of the law. On his return to Scotland he was successively employed by King James V., the regent Arran, and Mary of Lorraine. Of the early part of his life however few particulars are known. In the end of the year 1550 his
of 'Reports of the Decisions of the Court of Se

commences; and about the same time he appears in the sederunts of the court as an extraordinary lord of session. Not many years afterwards his eldest son William, having returned from the Continent, whither he had been sent, like his father, in early life, was appointed by the queen dowager secretary of state; but afraid, as it seems, of his safety at that troublesome period, he left her and joined the Protestants in October, 1559, and in August, 1560, acted as speaker of the Convention, in which the Roman Catholic supremacy in Scotland was destroyed. In the meantime his father Sir Richard had become blind. At what time this calamity overtook him is uncertain: it was probably about the year 1559, in the end of which he concludes his 'History and Chronicle of the House and Surname of Seaton.' He continued however to report the decisions of the court of session; and what is remarkable, from about the period of his becoming blind he began to write and collect Scottish poetry. In 1562 he was made lord privy-seal; but this office he in a few years afterwards resigned in favour of his second son John, who was also the next year appointed an ordinary lord of session. His eldest son William had been some time before in the like situation, being in 1561 appointed an extraordinary lord of session, and in 1566 advanced to the place of an ordinary lord of the same court. Old Sir Richard's blindness and peaceful disposition concurred to save him from mixing in the political broils of that period; but nevertheless, in 1570, when his sons were denounced as rebels by the king's party, his lands were ravaged by the English. He lived however to know that his second son was reinstated on the bench as a lord of session, and he died only a month or so before he was advanced to the high office of chancellor of Scotland. He died on the 20th March, 1586, with the character of 'a maist unspotted and blameless judge, ane valiant, grave, and worthy knight;' but it is in his character of a writer and collector of Scottish poetry that he is now chiefly remembered.

His collections consist of two volumes: a folio, comprehending 176 articles; and a quarto, of 96 pieces, in the handwriting of Mary Maitland, his daughter. They are now preserved in the Pepysian Library, Magdalen College, Cambridge. His poetical writings were for the first time printed in an entire and distinct form in 1830, in one quarto volume, by the Maitland club, a society of literary antiquaries, so designated from this distinguished collector of Scottish poetry.

MAITTAIRE, MICHAEL, was born in France, 1688, of Protestant parents, who settled in England at the revocation of the edict of Nantes. Maittaire was educated at Westminster school under Dr. Busby, and obtained at Oxford, whither he afterwards went, a warm friend and patron in Dr. South. He took his degree of M.A. in 1696, and from 1695 to 1699 discharged the duties of second master in Westminster school. In 1699 he resigned that appointment and devoted the remainder of his life to literary pursuits. He died August 4th, 1747, at the age of 79.

Maittaire was a learned and laborious scholar. He edited many of the classical authors, with useful indexes, and also wrote several works, of which the most important are—'De Græcæ Linguæ Dialectis,' London, 1706, 1742; the best edition is by Sturz, Leip., 1807; 'Stephanorum Historia vitas ipsorum ac libros complectens,' Lond., 1709; 'Historia Typographorum aliquot Parisiensium vitas et libros complectens,' Lond., 1717; 'Annales Typographici ab artis inventæ origine ad annum 1557 (cum Appendice ad annum 1664),' Amst. and Lond., 1719-1741; 'Marmora Oxoniensa,' Lond., 1732.

MAIZE, or *Indian Corn*, is a plant commonly cultivated in the warmer parts of the world, where it answers a purpose similar to that of wheat in more northern countries. It is the *Zea Mays* of botanists, a monœcious grass, of vigorous growth, with stems not more than two feet high in some varieties, and reaching the height of eight or even ten feet in others. The leaves are broad, and hang down from large rough sheaths which surround the stem. The male flowers grow in loose, terminal, compound racemes, standing clear of the leaves; the females are arranged in numerous rows on a spike, which is wrapped round by several folds of sheathing bracts, which press upon the grains and give them the flattened figure they eventually acquire when ripe. Each grain has a long thread-like style, which projects beyond the enveloping sheaths; and as there are some hundreds of them upon each spike, the whole form a long tassel, which looks as if made of silk. The ripe grains are regularly arrayed one over the other in rows, are compressed at the sides, flattened at the apex, and of various colours. Their most common colour is pale yellow; some are white, some party-coloured, and there are varieties with blood red and even purple grains. A plant generally bears two full ears, the grains of which vary greatly in number: some of the largest ears in America contain at least 800 grains.

This plant in its wild state is met with in Paraguay, according to Auguste de St. Hilaire. It was also found on the continent of North America by the Europeans on their arrival there. A second species, called *Curagua* by Molina, is said to occur in Chili; but little is known of it further than that the leaves are serrated, and all the parts much smaller than usual.

It seems that there is a particular line on the continent of Europe north of which the maize does not thrive. To the south of this line, which passes through Nancy, formerly the capital of Lorraine in France, it has in a great measure superseded wheat and rye as the common produce of the land. The bread made from maize is not so palatable as wheat or rye bread; but by mixing it in certain proportions with wheat it makes a very pleasant food. In the United States of North America Indian corn forms almost the only bread eaten by many of the people; and in the slave-states it is the only bread that the negroes eat. It is not however in the shape of baked bread that maize is most generally used in Europe, but in boiled messes and soups, as peas are with us: it is not only the ripe grain which is eaten, but the ear in every state, from that of a green vegetable to an unripe corn. It is boiled, stewed, and baked: it is a substitute for cabbage or green-peas in its early stage; and is used in some way or other to its complete maturity. Nothing can be better than ripe maize to fatten hogs or poultry with; and the young stem cut down quite green gives one of the best and most abundant varieties of green food for cattle.

A plant which gives such a return cannot be expected to ripen its grains in poor land, or without attentive cultivation. The land must be naturally fertile, or made so by art; it must be well prepared to receive the seed, and sufficient manure must be given to recruit it. A light, moist, and warm soil suits this plant best. It thrives well on land broken up from grass, as is the case with most plants. As it is always sown in rows, and the plants thinned to a considerable distance, the intervals may easily be ploughed, or stirred with the horse-hoe, by which means the weeds are kept down, and the earth fertilized by exposure to the air. The seed should be taken from the largest and best formed ears; those at the end should be rejected as less perfect. They should not be taken off until they are wanted for sowing, and then steeped in water to soften them. If the seed were steeped in brine and dried with quicklime, as is usually done with wheat, it might probably be advantageous, as this grain is subject to smut and brand as well as wheat; but this is not often done. The time for sowing maize in the south of France is the month of April; farther north it is sown later for fear of frost, which would entirely destroy the plant on its first appearance above ground: this is one of the reasons why it could not safely be sown in England before the middle or end of May, and it could scarcely be expected to ripen its seeds before the winter's frost set in.

The distance between the rows of maize vary from two to four feet. In good ground the latter distance has produced the heaviest crop. The seed is sometimes sown in the furrow after the plough, and sometimes put in with a dibble. The latter seems the best way, and, as the rows are wide and the seeds need not be put in nearer than a foot apart in the rows, an acre will be soon dibbled by hand. Two or three inches deep is sufficient to make the seed germinate readily. In warm moist climates the plant is very soon above ground. In fine weather, and when the seed has been steeped, it will be above ground in five or six days. When the plants are three or four inches out of the ground, and no frost is feared, they are thinned out to two feet apart, and in very rich soils three feet is better. In this case three or four ears may be expected to ripen on each stalk. In thin soils on a retentive subsoil the earth is raised in ridges, or, what is better, in mounds, by crossing the ridges with the plough, and three or four seeds are put into each hillock, which are two or three feet apart. As the plants rise, only one, or at most two are left in each hillock, and the earth is carefully moulded up to the stems; thus a deep dry bed is provided for the plant, and there is sufficient moisture from the impervious subsoil. This method might perhaps be adopted with advantage in England, in experiments on maize, where the situation admits of its cultivation. Maize, however sown, must be repeatedly hoed. At the first hoeing the plants which are too close are pulled up, and where there is a deficiency they are planted in: at least, this is the practice in Europe; but in America the general practice is to plant fresh seeds in the vacant places. When the plants are a foot high, there is a second hoeing, the weeds are then cut up, and some earth is drawn towards the plants, and raised around the stems. The reason of this is, that there are several joints very near each other at the bottom of the stem, and from each of these fibres strike out into the soil which is brought into contact with it, and form additional roots to the plant, as they do from the crown of the roots of wheat. When the flowers are ready to expand, a third hoeing is given, to kill weeds and open the surface of the soil slightly. The earth which is raised around the stems should be flattened a little at top, and even slightly hollowed out near the stem, to collect the dews and rains in dry seasons. If any tillers or shoots appear from the bottom of the stem, they should be carefully removed, as they diminish the nourishment which should go to the main stem. A fourth hoeing and earthing up, at the time when the seed begins to swell, is useful, but seldom given, for fear of unnecessary expense. In many countries they sow or plant various vegetables in the intervals between the rows of maize, of which the most advantageous are turnips and cabbages, which may be sown or planted between the maize, after the last hoeing. French beans, except they be dwarfs, are not so proper, as they shade the maize and prevent its maturity. In warm climates cucumbers and melons are often raised there. In Carolina, where they hoe their maize only twice, a running weed springs up rapidly called *syntherisma*, which is much relished by cattle, and is cut several times before winter.

The time of flowering is very critical for the maize: a cold damp atmosphere may make a great part of the crop fail. In situations where this is to be feared, it is safe to sow maize at several times, with a week's interval: thus the risk is divided, and it is not so likely that the whole crop will be in flower in ungenial weather.

The male flowers, just as they expand, are excellent food for cattle; and it is usual in many places to cut off a great portion of them for this purpose. If it be done judiciously, there is no danger, provided a sufficient number of male flowers be left to impregnate the females: one in a square of about fifteen or twenty feet is thought sufficient. After the seed is set, it is customary, in many places, to cut off the whole top of the stem, with the upper leaves, and give them to the cattle; but this is by no means to be recommended: the wound thus made bleeds, and much of the sap is lost; besides the upper leaves serve to elaborate the sap and assist its circulation; they should therefore be left on as long as they are green, and other food found for the cattle.

All plants which stand too close or have no ears upon them should be pulled up and given to the cows, to give air to the rest; all those also that are very late and have abortive ears should be taken up, as they would at all events not ripen their seed. The young ear is preserved as a pickle, like young cucumbers: when a little advanced it is roasted on the coals, or before the fire, and is pleasant to eat: in the green state, when the grains are still soft and milky, it is boiled, and used as a vegetable, and is considered a delicacy.

Maize is subject to diseases similar to those of wheat and other grain; and it is supposed, as observed before, that the steeping and liming may prevent them in a great measure.

When the maize is fully ripe, which it is not until the sheath of the ear opens and appears quite dead, the ears are twisted off by hand and laid in a dry place; they are turned occasionally that the sheath may not become musty, and are then stored in a dry place: the seed keeps better so than when it is separated. The taking off the seeds from the ear is a laborious operation; it may be done by the flail, but is most easily accomplished by an old blunt sword or iron hoop fixed over a tub. The ears are rubbed hard over this edge, and the seeds fall into the tub. They have a simple machine in America, which does the work quick. The core or rachis is only fit for burning in the oven. The leaves are gathered for fodder a short time before the ears are pulled. In America and in Italy they stuff mattresses with the dry sheath, which makes a cool and elastic bed.

All animals are fond of maize, especially horses, pigs, and poultry; it gives the flesh of the two last a peculiarly fine flavour. The most profitable way to use maize in fattening animals is to grind it into meal, and mix it with warm water into a pottage; and, for horses, to soak it twenty-four hours in water before they are fed with it. In the dry state it is so hard that it wears their teeth, and in young horses is apt to produce blindness by the exertion of the muscles of the jaw in chewing it.

One of the most important uses of maize in Europe is to sow it thick, to be cut green as food for cows, oxen, and sheep. In a proper climate there is no plant which gives so great a mass of green food as maize. The produce is most abundant and nutritive. The largest varieties should be chosen. The seed may be sown in drills in April, and in September a crop might be mown, which would give admirable fodder for every kind of cattle. It is said to exhaust the land; but what will not exhaust it, more or less, which gives much nourishment? Maize will well repay the manure which may be required to restore the humus that it has consumed. If it is sown early, a second crop may be raised the same year; for it does not spring up again, like grass, after being cut. Where the land admits of irrigation, the growth of the maize is most rapid and luxuriant. The time to cut it is when the male flowers are just appearing out of the sheath in which they are enveloped in the early stage of their growth. It may be dried into hay, and will keep good for a couple of years; but in this state it must be bruised or soaked when given to cattle, as the stems get very hard in drying; they may however be cut, as the cane-tops are in the sugar-plantations.

MAJOR (Latin), *Greater*, in music, a term applicable to the imperfect concords, but chiefly to the interval of the 3rd. It is also used to distinguish the mode which takes a major or sharp 3rd, from that having a minor or flat one. The *major* mode has always a greater 3rd—*i.e.* a 3rd consisting of two tones; and the minor mode has always a minor 3rd—*i.e.* a 3rd consisting of a tone and a semitone. [KEY; MODE; THIRD.]

MAJOR, a field-officer next in rank below a lieutenant-colonel, and immediately superior to the captains of troops in a regiment of cavalry, or to the captains of companies in a battalion of infantry. His duty is to superintend the exercises of the regiment or battalion, and, on parade or in action, to carry into effect the orders of the colonel. The major has also to regulate the distribution of the officers and men for the performance of any particular service; and he has a temporary charge of the effects appertaining to any individual of the corps, in the event of the absence or death of such individual.

This class of field-officers does not appear to have existed before the beginning of the seventeenth century; and, at first, such officers had the title of *serjeants-major*, a designation borne at an earlier time by a class corresponding to that of the present majors-general of an army. (Grose, vol. i., p. 243.)

No mention is made of either lieutenants-colonel or majors as field-officers in the account of Queen Elizabeth's army in Ireland (1600). But Ward, in his *Animadversions of Warre* (1639), has given a description of the duties of the latter class, under the name of serjeants-major, from which it appears that those duties were then nearly the same as are exercised by the present majors of regiments. They are stated to consist in receiving the orders from the general commanding the army; in conveying them to the colonel of the regiment, and subsequently in transmitting them to the officers of the companies; also, in superintending the distribution of ammunition to the troops, and in visiting the guard by day or night.

A brigade-major is a staff-officer who performs for a brigade, or in a garrison, duties corresponding to those of a major in a regiment or battalion.

The prices of a major's commission are,—

In the Life and Royal Horse Guards	£5350	: daily pay	£1	4	5.
In the Dragoons	4575	„	0	19	3.
In the Foot Guards (with the rank of colonel)	8300	„	1	3	0.
In the regiments of the line	3200	„	0	16	0.

A serjeant-major of a regiment is a non-commissioned officer, who in general superintends the military exercises of the soldiers: on parade, he has the care of dressing the line.

MAJOR-GENERAL. [GENERAL.]

MAJOR, or MAIR, JOHN, was born at the village of Cleghorn, near North Berwick, in East Lothian, about the year 1470. He appears to have studied for a short time both at Oxford and Cambridge, but he always regarded the university of Paris as his true *alma mater*, whither he proceeded in 1493, and where he attached himself successively to the colleges of St. Barbe, of Montaigu, and of Navarre. Having been made a doctor of the Sorbonne in 1505, he betook himself to the teaching of the scholastic philosophy, or divinity, in the college of Montaigu, and in this department soon came to be reputed one of the most distinguished ornaments of the university. Mair's scholastic writings indeed have been rated by Dupin and others in later times as the ablest that have come down to us from that age.

In 1519 he returned to his native country, and officiated for some time as one of the regents or masters in St. Salvator's college, St. Andrew's; but a dispute with some of his colleagues soon induced him to go back to Paris, and there he remained till 1530, when he was induced once more to transfer himself to St. Andrew's, which he never afterwards left. He became eventually provost or principal of St. Salvator's college, and appears to have died in that office about the year 1550.

Major's works are all in Latin, and the principal are Commentaries on the Four Books of Sentences, some theological expositions and commentaries on parts of the Scripture, and his History of Scotland, entitled 'De Historia Gentis Scotorum, seu Historia Majoris Britanniæ,' first printed in 4to. at Paris, in 1521. The style of all his writings is careless and inelegant to barbarism; but his History appears to have the merit of being a faithful enough chronicle of events, so far as he knew them. It is however as little marked by any spirit of critical or profound research as by classical purity of diction. Both this and some of his philosophical writings are remarkable for a freedom of sentiment upon points both of civil and ecclesiastical government, which he is believed to have derived from his teachers Jean Gerson and Pierre d'Ailly, and to have communicated to his famous pupils Buchanan and Knox. Dr. MacCrie, in his 'Life of Knox,' Edinb., 1813 (vol. i., p. 345), has given some extracts from Major's works, which evince the liberal complexion of his opinions. The well known epigram of Buchanan however, in which he designates him 'Solo cognomine Major,' testifies that the great scholar and wit had no very high opinion of the intellectual endowments of his old master.

MAJORCA. [MALLORCA.]

MAKRI. [ANATOLIA.]

MAKRIZI (or, with his full name, Takki-eddin Abu-Mohammed Abul-Abbas Ahmed Almakrizi), a celebrated Arabic writer, was born at Cairo between A.D. 1358 and 1368. His family originally lived in one of the suburbs of Baalbec, called Makriz, whence he derived the surname by which he is usually known. We have very few particulars of his life; but it appears that he resided at Cairo, during the greater part, if not the whole of his life, that he discharged at different times the duties of several public offices, and that he died, at an advanced age, in A.D. 1442.

Makrizi wrote several historical works: of which copious extracts are given in De Sacy's Arabic Chrestomathy. The most important of these works is his 'Description of Egypt;' which gives an account of the history of the country from its conquest by the Mohammedans, as well as a description of its natural history and antiquities, and of the manners and customs of the inhabitants. De Sacy, in his notes added to his translation of Abd-Allatif, published under the title of *Relation de l'Egypte*, Paris, 1810, has made many interesting quotations from the work of Makrizi.

The only works of Makrizi which have been printed are, as far as we are aware: 'Historia Monetæ Arabicæ,' in Arabic and Latin, by Tychsen, Rostock, 1797, of which a French translation, much superior to the Latin one by Tychsen, was published by De Sacy, under the title of 'Traité des Monnoies Musulmanes,' Paris, 1797; 'An account of the Mohammedan Princes in Abyssinia,' by Rink, Leyd., 1797; 'Narratio de Expeditionibus à Græcis Francisque adversus Dimyatham ab A.C. 708 ad 1221 susceptis,' in Arabic and Latin, by Hamaker, Amst., 1824; 'Historia Coptorum Christianorum in Ægypto,' Arabic and Latin, by Wetzer, 1828.

MALABAR, a province of Southern India, lying between 10° 20′ and 12° 20′ N. lat., and between 75° 15′ and 76° 55′ E. long. Its greatest length from north to south is 118 miles, and its breadth does not in any part exceed 50 miles: its area is about 7250 square miles. It is bounded on the north by Canara; on the east by Coorg, Wynaad, and Coimbatore; on the south by the territory of the Cochin rajah; and on the west by the Indian Ocean.

As to its general features, Malabar may be divided into two portions. One of these, which is by far the most extensive, consists of low hills separated by narrow valleys. The hills have in general steep sides and level summits; the best soil is on the sides, and, to prevent this being washed away, the surface is formed into a series of terraces. The summits of many of the hills are bare, especially towards the north, where they exhibit little besides native rock. The soil in the valleys has been washed down in the course of ages from the hills, and is extremely fertile. The other portion of the province consists of a level plain or belt along the coast, seldom more than three miles wide, and often not so much. The soil is sandy and poor, but being intersected by numerous mountain-streams, it is well adapted for the cultivation of rice. The whole of the province lies immediately below the western ghauts.

The pepper-vine grows most abundantly along the whole coast-line of Malabar, and its produce forms the chief article of export from the province. A great part of it is sent to Europe, but large quantities are also exported to China, or conveyed by native traders to Arabia and the north-west countries of India. Sandal-wood, which is another principal article of export from Malabar, is not produced within the province, but is brought from above the western ghauts. Jaggry, a coarse kind of sugar, is made in large quantities from a species of palm, the *brab-palm*, and is commonly sold at a very low price, less than three shillings per hundredweight. Part of the coast is covered with thick forests of cocoa-nut trees, from the produce of which a revenue is drawn by the government.

The province is divided for the purposes of internal government into 2212 villages, which do not however consist, as in most other parts of India, of aggregations of houses, but rather of territorial divisions answering more to our parishes. The dwellings of the natives are for the most part scattered over the face of the country. Almost the only collections of houses are found in the seaports. The principal of these are Tellicherry, Mahé, and Calicut. [CALICUT.] Tellicherry is in 11° 45′ N. lat. and 75° 33′ E. long. In 1683 a factory was established there by the presidency of Surat, for the purchase of pepper and cardamom seeds. It is still the residence of the richest native merchants, and is the principal market for the sandal wood brought from the interior; but a great part of the export trade has of late years centred at Mahé, a small town and port about five miles to the southward, which was settled by the French in 1722.

Malabar is one of the few parts of Hindustan in which the ownership of the soil is recognised as belonging to individuals, and not to the supreme government. Landed property is held in this province, as well as in Canara, Cochin, Travancore, and Bednore, on tenures which from time immemorial have never been questioned. It might be more correct to say that the English government has not committed the same error with regard to those provinces as it has in other parts of India, that of considering the property in the land to belong to the state. The succession to lands in Malabar follows the same rules as those that regulate succession to other kinds of property.

The population consisted almost wholly of Hindus until the invasion of Hyder Ali in 1760, since which time there has been an accession of *Moplays* (Mohammedans), Christians, and Jews, but not in considerable numbers. Among the Hindu population the distinctions of caste are kept up with the greatest scrupulosity. The distances within which an individual of an inferior may not approach one of a superior caste are accurately defined. The distinctive names of the castes are—1st, Namburics or Brahmins; 2nd, Nairs or Sudras; 3rd, Tiars, who are free cultivators of the land; 4th, Malears, who are musicians and conjurors (these are free also); 5th, Poliars; these are slaves, and are properly below all caste; but there is an outcast tribe inferior even to these, called Niadis. There are several subdivisions of the first three castes. The Poliars are bought and sold like cattle, either with or separate from the land, one of them being generally reckoned of equal value to two buffaloes. They are often treated with severity, and are of a miserable appearance, squalid, and diminutive.

The whole province was subdued in 1760 and 1761 by Hyder, and in 1788 it was overrun by Tippoo, and the rajahs were mostly driven for refuge to Cochin and Travancore, but in 1790 were reinstated by the English government, under whose superintendence the affairs of the province have much improved, the revenues have been augmented, and the trade increased. The province is under the immediate superintendence of the governor of Madras.

MALABAR LANGUAGE. [Hindustan, p. 229.]

MA'LABATHRUM, a name which occurs frequently among the writings of the antients, and which was applied to a leaf imported from India, whence it was likewise called φύλλον ἰνδικόν, and also simply Folium. It was employed by them both as a medicine and as a perfume. From it there was prepared both an oil and a wine by maceration of the leaves in these menstrua. Many fabulous statements accompany the earliest accounts, as that of Dioscorides, of whom it is stated that by some they are thought to be the leaves of the Indian Nand; that they are moreover found floating on Indian marshes, and that they grow without roots (lib. i., c. 11), and that (lib. ii., c. 10) it is by feeding on them that the animal affording the onychia, or unguis odoratus of the antients, becomes aromatic. In the works of the Arabs *saduj* is given as the synonyme of Malabathrum; and *saduj*, both in Persian works and in India, is applied to tej-pat, or the leaf of the *tej*, which is a species of Cinnamomum, *C. albiflorum*, growing in the dense forests of the valleys of the Himalaya, which extend from Rungpore to the Deyra Doon in 30° N. lat. Dr. Hamilton found the same name applied to a very nearly allied species, the *C. Tamala*. Both species most probably yield the leaves which were so highly esteemed in antient times, and are still as extensively employed in eastern countries, and may be found in every Indian bazaar under the names of *tuj* or *tej-pat*, or by the Arabic name of *saduj-hindee*. They are analogous in all respects to bay-leaves produced by the Laurus nobilis, and are in fact the bay-leaves of India. The name Malabathrum no doubt is derived from *Tamala-putra*, or Tamala-leaf, as was first indicated by Garcias: 'Appellant autem Indi Folium Tamalapatra quam vocem Græci et Latini imitantes corrupte Malabathrum nuncuparunt.' These are brought from the interior of almost inaccessible forests, and necessarily stripped from the branches for the facility of carriage; hence most probably originated the fables with which their early accounts are accompanied.

MALACCA, a town in Southern Asia, situated on the western coast of the Malay Peninsula, in 2° 14′ N. lat. and 102° 12′ E. long., on the straits called by its name. It is on the northern banks of a small river. The roads along the shores are good and safe. South of the town there is a small island, between which and the continent is a harbour, where, during the south-west monsoon, vessels not drawing more than 16 feet water are secure. The bar at the mouth of the river has only water enough during high tide for boats. Many of the houses are tolerably well built, but the greatest part, which are inhabited by Asiatics, are composed of bamboo and mat huts. On the southern side of the river are the ruins of a fort, now converted into a public promenade.

Malacca was built in 1252, by Sri Iscander Shah, the king of the Malays, after his expulsion from Singapura, a town situated on or near the site of the emporium now called Singapore. It was first visited by the Portuguese in 1507, and taken by Alfonso Albuquerque in 1511. It was then a large commercial town, and the harbour contained 300 vessels. It continued in a flourishing condition till 1640, when it was taken from the Portuguese by the Dutch, upon which event its commerce began to decline, being partly transferred to Batavia. But its position on the great thoroughfare between the Gulf of Bengal on one side and the Indian Archipelago and China still gave it some importance; though the establishment of a British colony in the island of Pulo Penang, in 1786, diminished its commerce. It was taken possession of by the British in 1795, restored at the peace of Amiens, but soon afterwards taken again. In 1814 the Dutch recovered possession of it; but the British having founded the town of Singapore in 1819, which in a few years became a great commercial place, Malacca sunk to insignificance. The town and fort of Malacca, with its dependencies, were ceded to the English by the treaty between the Britannic and Netherland governments of March, 1824.

Besides the town, this colony consists of a tract of country about 40 miles long and 30 miles wide; its surface may be about 1000 square miles. The country along the sea-coast, to the distance of 12 or 15 miles, is low and nearly level; in many parts swampy, and mostly covered with wood. The soil is not distinguished by fertility; and though rice is raised, this article, as well as other grain, is annually imported from Bengal. Fruits succeed exceedingly well, as pine-apples, shaddocks, oranges, &c. Cocoa-nut palms are numerous. The cultivation of coffee has been introduced lately. Pepper is grown to a considerable amount, and 4000 peculs (1 picul = 133⅓ pounds) are annually exported. The amount of tin annually got from the mines is estimated at 4000 piculs. There is also gold.

The bulk of the population consists of Malays. There are some Hindus and Chinese, and also some descendants of the Portuguese and Dutch. In 1822 the population in the town of Malacca amounted to 12,000 souls, and in the whole colony to 22,000. After the British got possession of it, the number decreased by emigration to Singapore, but the population has recently begun to increase, and is said to be 30,000.

(Crawfurd's *Journal of an Embassy to the Courts of Siam and Cochin China*; Finlayson's *Journal of a Mission to Siam and Hué*; *Notices of the Indian Archipelago*, &c., collected by J. H. Moor, Singapore, 1837. [Naning.]

MALACCA, THE STRAITS OF, separate the Malay Peninsula from the island of Sumatra. They begin on the north between Diamond Point on Sumatra and the island of Pulo Penang near the shores of the continent, about 5° 20′ N. lat., and terminate on the south between the most southern cape of the Asiatic continent, the Tanjong Burus (1° 15′ N. lat.), and the islands of Carimon or Krimun (1° N. lat.). Its direction is from north-west to south-east, between 97° 30′ and 103° 40′ E. long. At its northern extremity it is nearly 180 miles wide, but southward it grows narrower, and opposite the town of Malacca, from which it takes its name, the strait is hardly 36 miles wide, and both shores are visible from the middle of the channel, though they are rather low. The strait preserves this width to its southern extremity. Being enclosed on the south-west and north-east by countries in which the mountain-ranges rise to a great elevation, this strait is not subject to the violence of the south-west and north-east monsoons, and the sea, especially at its southern extremity, is always as smooth as a pond. But when the Gulf of Bengal is agitated by the strong gales of the north-west monsoon, there is a heavy sea in the northern and more open portion of the strait, which at that time inundates many parts of the low shores which are immediately contiguous. The countries bordering on the strait have not the periodical seasons of rain and dry weather, but rain occurs the whole year round, and mitigates the heat of the atmosphere. Perhaps in no part of the globe is the temperature of the air less subject to changes than on these shores.

(Finlayson's *Journal of a Mission to Siam and Hué*; and Crawfurd's *Journal of an Embassy to the Courts of Siam and Cochin China*.)

MA'LACHI (מַלְאָכִי, 'my messenger'), the last of the twelve minor Hebrew prophets. So completely are we ignorant of the personal history of this prophet, that it has been doubted whether 'Malachi' is the name of a person, or only a title descriptive of the prophetic office. In the absence of any positive proof of the latter supposition, the former must be adopted as the more natural. Many of those who believe that 'Malachi' is an official title identify the prophet with Ezra. This was the opinion of Jerome.

Malachi evidently prophesied after the Babylonish captivity. He was later than Haggai and Zechariah, for he does not, like them, exhort the people to zeal in rebuilding the Temple, but he refers to it as already built (i. 7, 10; iii. 1, 10). In chap. i., ver. 8, he speaks of a political ruler of the people; now, no one appears to have held such an office later than Nehemiah, after whose time political power was in the hands of the priests. Moreover the state of things described and reproved in this prophecy agrees with the account which Nehemiah gives of the manners of the people after his second return from Persia into Judæa. (Compare *Mal.* ii. 8-11, with *Nehem.* xiii. 23-29; *Mal.* iii. 8, 10, and *Nehem.* xiii. 5, 12 x. 38, 39, with *Nehem.* xiii. 6-13; *Mal.* i. 8, 11, 13, ii. 8, with *Nehem.* xiii. 15, &c.) Hence Vitringa ahd others have concluded that Malachi prophesied during the latter part of Nehemiah's administration (about B.C. 432 or 420).

The object of this prophecy is to reprove the people and the priests for their irreligion. To the complaint of the people, that God dealt unkindly with them, the prophet replies by comparing their prosperity with the calamities that had befallen the Edomites (i. 2-5). He reproves the priests for their dislike to the service of God, their unholy sacrifices, and their perversions of the law, and the people for their intermarriages with the neighbouring heathen nations (i. 6, to ii. 16). Before the Captivity idolatry had been the great sin of the Jews, but now they seem to have been prone to infidelity, complaining that the wicked were favoured by God, and that the Messiah did not appear. The prophet therefore announces the approach first of the Messiah's precursor, and then of the Messiah himself, whom he styles 'the messenger of the covenant,' to purify the people of God, and to punish the ungodly (ii. 17, to iii. 6). He points to the withholding of tithes and offerings as the cause of the barrenness of the land, and promises a return of plenty upon the payment of these dues (iii. 7-12). He again answers the infidel complaints of the people by referring to a future recompense, and predicts the coming of Elijah to bring the people to repentance, denouncing a curse upon the land if they despised his ministry (iii. 13, to the end). This part of the prophecy is applied in the New Testament to John the Baptist. (Compare *Mal.* iii. 1, with *Matt.* xi. 10, *Mark,* i. 2, *Luke,* i. 76, vii. 27; and *Mal.* iv. 5, 6, with *Matt.* xi. 14, xvii. 10-13, *Mark,* ix. 11-13, *Luke,* i. 17.)

The prophecy of Malachi is almost entirely in prose. His style has the vigour which belongs to an indignant censor of abuses, but he is deficient in the poetical beauties of the earlier prophets. Bishop Lowth remarks that 'the book is written in a kind of middle style, which seems to indicate that the Hebrew poetry from the time of the Babylonish captivity was in a declining state, and being past its prime and vigour, was then fast verging towards the debility of age.' (*Prælec.*, xxi.) The canonical authority of this book is not disputed.

(Rosenmüller's *Scholia;* the Introductions of Eichhorn, De Wette, Jahn, and Horne.)

MALACO'LAPHUS. [WOODPECKERS.]

MALACO'LOGY. The science of molluscous or soft-bodied animals (Μαλακὸς and λόγος[*]) includes the knowledge of such animals, whether protected by shells or entirely naked, and their distribution into classes, subclasses, families, genera, and species. In this more extended and philosophical view of the subject, *conchology* may now be considered as merged; and the more modern classifications are based upon the anatomy of the soft parts and the habits of the animals, as well as upon the structure of the shells in those molluscous forms which have that protection. In the article CONCHOLOGY will be found a short statement of the reasons for treating the subject under the present title.

The shell-collector of former days looked upon his drawers, if they were rich in rare species or varieties, as containing an assemblage of gems; and indeed the enormous prices given for fine and scarce shells, joined with the surpassing beauty of the objects themselves, almost justified the view which the possessor took of his cabinet of treasures. They were to him really 'Les Delices des Yeux et de l'Esprit;[†] and the energetic zeal with which he collected and the sacrifices that he made to procure a fine and perfect *Many-ribbed Harp*, a *Gloria Maris*, or *Cedo Nulli*, among the cones; an *Aurora* or *Orange-Cowry*, a *Voluta aulica* or *Voluta Junonia*, &c., were only comparable to the extravagances of those visited by the tulip mania when it was at its height. But though they were the delight of his eyes, they were, in nine cases out of ten, little more to the owner of them: they were mere trinkets on which he looked dotingly without knowing, and scarcely wishing to know, the organization of the animal whose *skeleton* only was before him. This innocent trifling came at last to be viewed in its true light by some collectors worthy of better employment, who put off childish things and went deeper into the subject. Lister, Adanson, Linnæus, Poli, Cuvier, Lamarck, De Blainville, and others gave dignity to this department of zoology, and gradually raised the science to its proper rank; whilst the comparatively imperishable nature of the covering of the testaceous mollusks became, in the hands of such men as William Smith and his followers, among the most valuable records by which the stratification of the earth's crust could be demonstrated and its geological history deciphered. [GEOLOGY, vol. xi., p. 131.)

We must first examine what animals are included under the general name of *Mollusca*, or, if M. de Blainville's term be adopted as being the more comprehensive, *Malacozoa* or *Malacozoaria*.

The Μαλάκια of Aristotle, his 'Οστρεα or 'Οστρακόδερμα, and his Μαλακόστρακα, are distinguished by him from the fishes as not having, like the latter, blood; which must be understood as meaning that they were without red blood. The Μαλάκια are further described as having all the fleshy parts external and the solid or firm parts internal, and are thus distinguished from the 'Οστρακόδερμα, which are defined as having the fleshy parts internal and the solid parts external. The Μαλακόστρακα are described as also having the solid parts of their bodies external, and the soft and fleshy parts internal, but as being protected externally by a *crust* instead of a *shell*, and having ambulatory feet.

Thus the Μαλάκια and 'Οστρακόδερμα of Aristotle, who is followed by Ælian and the Greek naturalists generally, correspond with the *Naked* and *Testaceous Mollusca* of the moderns.

Pliny and the antient Latin zoologists employ the same denominations as the Greeks, though they have translated them by the terms *Mollia* for the *Naked*, and *Testacea* for the *Shell-protected* Mollusks.

Upon the revival of letters, we find Belon, Rondelet, Gesner, and Aldrovandus adopting the denominations of the antients, and Jonston, in his general compilation, continuing the same under the general terms of *Exanguia* or *Exanguia aquatica;* and the more particular ones, as applicable to the animals immediately under consideration, of *Mollia* or *Mollusca* and *Testacea* or *Conchylia*.

Our countryman John Ray, who has justly been called the Precursor of Linnæus, and whose systematic views on the subject of zoology are well worthy of the attention of the student, appears to have been the first who applied the term *Vermes* or *Worms* to all invertebrate animals (with the exception of Insects and Crustaceans), whose blood or circulating fluid is white, and who employed the term *Vermes* (*Mollusca*) and *Vermes* (*Testacea*) to denote the divisions of Aristotle.

Lister, in his 'Synopsis Methodica Conchyliorum,' cannot be considered as having done much as a systematist, and though that zoologist gave the anatomy of many molluscous animals, as had been done by Fabius Columna before him, and Willis, Swammerdam, and others after him, little appears to have been effected for a principle of classification resting on their external organization or their form, and still less for one resting on their internal structure.

Linnæus, in his 'Natural Division' of Animals into three sections, depending on the structure of the heart and on the circulating fluid, makes his third section consist of those animals which have an unilocular heart without an auricle (inauritum), and a white and cold circulating fluid (sanie frigida, albida). This section he separates into two subdivisions: the first (Antennata) consisting of the *Insects* (Insecta); the second consisting of the *Worms* (Vermes).

The following is his definition of his 'Class' *Vermes*, *Cor* (Heart) uniloculare, inauritum, sanie frigida. *Spiracula* (Respiratory organs) obscura. *Maxillæ* (Jaws) multifariæ, variæ variis. *Penes* (Intromissive generative organs) varii Hermaphroditis Androgynis. *Sensus* (Organs of Sensation) Tentacula (Caput nullum, vix oculi, non aures, Nares). *Tegmenta* (Covering or Integument) calcarea aut nulla, nisi spinæ. *Fulcra* (Organs of support or motion). Nulli pedes aut pinnæ.

The class so defined—and the very definitions will show how very limited the knowledge of the structure of such animals was in the time of the writer—consists of the following orders in the *Systema Naturæ*:—1. *Intestina.* 2. *Mollusca.* 3. *Testacea.* 4. *Lithophyta.* 5. *Zoophyta.*

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[*] M. de Blainville, who first proposed the term *Malacozoologie*, or by abbreviation *Malacologie*, makes the etymology μαλακὸς, soft, ζῶον, animal, and λόγος.

[†] The French title of Knorr's celebrated work in German and French. The German title is 'Vergnügen der Augen und des Gemüths,' 4to., Nuremberg, 1757, 1764

The order *Mollusca* consists of the following genera arranged in the subdivisions here given:—

Mollusca.

α. *Mouth above. Animal fixing itself by its base.*

Actinia. Ascidia.

β. *Mouth anterior. Body perforated with a small lateral foramen.*

Limax. Aplysia. Doris. Tethis or Tethys.

γ. *Mouth anterior. Body surrounded anteriorly by Tentacles.*

Holothuria. Terebella.

δ. *Mouth anterior. Body brachiated, or furnished with arms.*

Triton. Sepia. Clio. Lernæa. Scyllæa.

ε. *Mouth anterior. Body pedated.*

Aphrodita. Nereis.

ζ. *Mouth below, central.*

Medusa. Asteria or Asterias. Echinus.

In the above assemblage of animals we find a very heterogeneous arrangement; *Mollusca, Radiata*, and the genus *Lernæa* (which last the best authorities consider to be crustaceous), being there collected together.

The order *Testacea*, 'Testaceous simple mollusks, covered with a calcareous shell,' consists of the following subdivisions and genera:—

Testacea.

* *Multivalvia.*

Chiton (*Animal* Doris). Lepas (*Animal* Triton). Pholas (*Animal* Ascidia).

* * *Bivalvia:* Conchæ.

Mya (*Animal* Ascidia). Solen (*Animal* Ascidia). Tellina (*Animal* Tethys). Cardium (*Animal* Tethys). Mactra (*Animal* Tethys). Donax (*Animal* Tethys). Venus (*Animal* Tethys). Spondylus (*Animal* Tethys). Chama (*Animal* Tethys). Arca (*Animal* Tethys?). Ostrea (*Animal* Tethys). Anomia (*Animal* Corpus Ligula, *emarginata, ciliata, ciliis valvulæ superiori affixis.* Brachiis 2, *linearibus, corpore longioribus, conniventibus, porrectis, valvulæ alternis, utrinque ciliatis, ciliis affixis valvulis utrisque*). Mytilus (*Animal* Ascidia?). Pinna (*Animal* Limax).

* * * *Univalvia Spira regulari:* Cochleæ.

Argonauta (*Animal* Sepia). Nautilus (*Animal—Rumph. Mus.*, t. 17, f. D). Conus (*Animal* Limax). Cypræa (*Animal* Limax). Bulla (*Animal* Limax). Voluta (*Animal* Limax). Buccinum (*Animal* Limax). Strombus (*Animal* Limax). Murex (*Animal* Limax). Trochus (*Animal* Limax). Turbo (*Animal* Limax). Helix (*Animal* Limax). Nerita (*Animal* Limax). Haliotis (*Animal* Limax).

* * * * *Univalvia absque spira regulari.*

Patella (*Animal* Limax). Dentalium (*Animal* Terebella). Serpula (*Animal* Terebella). Teredo (*Animal* Terebella). Sabella (*Animal* Nereis).

This arrangement makes each of the generic characters reside in the shell, which is treated as the habitation of the 'animal.' Any one who examined this method soon found that it was impossible to affix any definite idea to many of the inhabiting animals; and but a vague one to most. To the bulk of the *Bivalves* or *Conchæ*, a *Tethys* is assigned as the animal; to the bulk of the *Univalves with a regular spire*, a *Limax* or Slug, which last is stated to be the animal of *Pinna* among the *Bivalves;* and yet the wonder is how Linnæus approached so nearly to a natural arrangement with the scanty materials—for scanty they were when compared with the information that we now possess—which formed the groundwork of his classification. Upon this system almost all scientific collections of *Shells* were arranged till within these few years; and so bigoted were many of the followers of this great man, who would have been the first to remodel his arrangement as new light poured in upon him, that every attempt at adopting the views of Cuvier, Lamarck, and others, and even those of Bruguière, founded upon the structure of the animals, was for a long time resisted, and almost resented as a presumptuous attempt at 'genus-making.'

Daubenton had read to the Academy of Sciences at Paris a memoir on the systematic distribution of *Shells*, in which, whilst he admitted that an acquaintance with these alone might suffice for arrangement, he remarked that a knowledge of the animals, or soft parts, was indispensable for forming a complete system of conchology and a natural distribution of these *exuviæ*. But though this indefatigable anatomist broached this opinion, he does not appear to have carried his plan into execution.

Guettard seems to have been the first who carried out the suggestion of Daubenton; for in 1756 he read a memoir inserted in the 'Transactions' of the same Academy, and therein established upon sound principles the necessity, in forming a classification of shells, of having recourse to the animals, or soft parts which they enclose, and a part of which the shells are. He did more; for he well characterised, upon the principle advocated by him, several genera, especially among the *Univalves*, as they were then called. And although he acknowledges that his information with regard to the *Bivalves* was not sufficient to enable him to carry out his views in the same manner with regard to them, he observes that they must be susceptible of being characterised with reference to the animals, or soft parts, as well as the Bivalves. Guettard further pointed out the division of shells into *Terrestrial, Fluviatile*, and *Marine*, and paid particular attention to the presence or absence of the *operculum*. There can be little doubt that these observations determined d'Argenville to add to his second edition of 'Conchyliologie' (1757) a number of figures of the animals, or soft parts, under the name of *Zoomorphoses;* these, it is true, are many, if not all of them, very bad.

The principles of Guettard were in the same year (1757) more extensively applied by Adanson in his 'Histoire Naturelle du Sénégal—*Coquillages*.' He distinguishes all the external parts of the animals and the shells. In the *Univalve Shells*, as they were then called, or, as Adanson denominates them, the *Limaçons*, he points out the whorls (spires), the apex (sommet), the aperture, the operculum, &c.; and in the Bivalves, under the name of *Conques*, he treats of the valves, which he terms battans, and notices their equality or inequality—whether they shut close or gape at any point—the hinge, and the number and form of the teeth composing it, with the cavities which they form —the ligament, considering it as to form and situation—the muscles, or rather muscular impressions with regard to their figure, size, and number; the nacre, &c. Out of the modifications of these parts of the bivalve shell he forms divisions—as five depending on the variations of the hinge; three depending upon the relative situations of the ligament externally, internally, &c.; three depending upon the modifications of muscular attachment, viz. *Conques* with one muscular attachment, *Conques* with two muscular attachments, and *Conques* with three muscular attachments; and three depending upon the presence or absence of the nacre and its modifications.

In the animals, or soft parts, of the *Limaçons*, he directs his attention to five principal parts.

1. The *tentacula*, or tentacles, which he names horns (cornes), and which he considers with regard to their number and shape as furnishing specific character, according as they are absent, or as there are two or four, or according to their conical or cylindrical form, the absence or presence of convexity (renflement) at their origin, and their situation at the root, or at the extremity of the head.
2. The *eyes*—their absence or presence; and in the latter case, their situation upon the head at the internal side of the root of the tentacles, behind the tentacles, towards their internal side, at the origin of the tentacles on their external side, above the root of the tentacles on their external side, at the middle of the tentacles on their external side, and at the summit of the tentacles.
3. The *mouth*, as provided with two jaws without a proboscis, or with a proboscis without jaws.
4. The *trachea*, or respiratory orifice, as formed by a simple hole situated on one of the sides of the animal, or by a long pipe which has its exit near the back.
5. The *foot*, according as it is divided by a transverse furrow at its anterior part, or not.

The *Conques* are regarded by Adanson with reference to four principal parts, viz.:

1. The mantle, which may be either divided all round into two lobes, or divided on one side only, or form a sac, open only at the two opposite extremities.
2. The trachea, or tube, which may be either single, and in the form of an aperture, double in the form of apertures, double in the form of separate and distinct pipes, or double in the form of united pipes.
3. The foot null, or not appearing externally, or a ing externally.

4. The byssus, or threads, which exist in some species, and do not exist in others.

The shells which he had observed at Senegal are figured and distributed generally in the following order, under two families.

Family 1.

LIMAÇONS.

§ I.

Limaçons Univalves.

Genera:—Cymbium. Bulinus (Physa of the moderns). Coretus (Planorbis of Guettard). Pedipes (Auricula of Lamarck). Cochlea (Bulimus of Bruguière). Lepas (Patella of modern authors and also embracing the Chitons). Haliotis. Yetus (Voluta of Lamarck, Cymba of Broderip). Terebra. Porcellana (Marginella and Oliva of authors). Cypræa. Peribolus (Young of Cypræa and small Marginellæ).

§ II.

Limaçons Operculés.

Strombus (Conus of the moderns). Purpura (including, with the true Purpuræ, Dolium, Cassidaria, Murex, Strombus of the moderns, some Mitræ, &c.). Buccinum. Cerithium. Vermetus. Trochus. Turbo. Natica. Nerita.

The *Conques* are also divided into two sections.

§ I.

Conques Bivalves.

Genera:—Ostreum (Ostrea of the moderns). Jataronus (Spondylus? of the moderns). Perna (including Mytilus, Modiola, Avicula, Pinna, and Cardita). Chama (including Venus, Cytherea, Mactra, Cardita, and some of Solen; but apparently none of the Chamæ of modern authors). Tellina (Donax of the moderns). Pectunculus (including Cardium, Arca, and some true Pectunculi of Lamarck). Solen.

§ II.

Conques Multivalves.

Pholas. Teredo.

Such is the system of Adanson; and although it presents errors, which would very probably have been avoided by so good an observer, if he had lived at a later period, when this branch of knowledge became better known, we must allow him the merit of being the first who practically applied the principle of classification based on the structure of the soft as well as the hard parts, or, in other words, on the organization of the animal and shell.

Geoffroy, a physician of Paris, applied the same principle to his little 'Treatise on the Terrestrial and Fluviatile Shells' in the neighbourhood of that city. His genera of Univalves amount to five only, viz. *Ancylus*, *Cochlea*, *Buccinum*, *Planorbis*, and *Nerita*. His genera of Bivalves consist of two, *Chama* and *Mytilus*; in the first of which he places *Cyclas*, and in the second an *Anodon* and a *Unio*.

Müller, the Dane, presented zoologists with a system founded on the same principle, which, whilst it was more complete than that of Guettard, inasmuch as it extended to all conchyliferous animals, was less natural than that of Adanson, and altogether inferior to it, as far as Adanson's went; but it was much more elaborate, and demands a great share of praise. The author of the *Zoologia Danica*, in his 'Vermium terrestrium et fluviatilium Historia,' adopts three primary divisions—*Univalves*, *Bivalves*, and *Multivalves*.

He divides the *Univalves* into three sections:—

1. Those testaceous univalves whose shell is pierced through and through; and in this section he places the *Echini* and *Dentalium*.

2. Those which have a very large aperture, consisting of *Akera* (*Bulla* of modern zoologists), *Argonauta*, *Bulla* (*Physa* of Draparnaud and others), *Buccinum* (*Limnæa* of the moderns), *Carychium*, *Vertigo*, *Turbo*, *Helix*, *Planorbis*, *Ancylus*, *Patella*, and *Haliotis*.

3. Operculated testaceous univalves, in which he places the genera *Tritonium* (*Buccinum* of Linnæus), *Trochus*, *Nerita*, *Valvata*, and *Serpula*.

The *Bivalves* are divided by the same author into two sections only: the 1st consisting of those which have a toothed hinge, including *Terebratula*, a new genus; the 2nd, of those which have a toothless hinge, including two new genera, *Anomia* and *Pecten*, which he separates from the oysters.

The *Multivalves* comprise the genera *Chiton*, *Lepas*, and *Pholas*.

There can be little doubt that it was to these authors (among whom we do not include Müller, whose works appeared subsequently, nor Geoffroy, whose treatise appeared nearly simultaneously) we owe the amended arrangement of Linnæus as it finally appeared in his last edition of the *Systema Naturæ* (the 12th, 1767), and as we have given it above. In the earlier editions the term *Mollusca* does not seem to have occurred to him. The naked mollusks are distributed among the order *Zoophytes*, of his class *Vermes*, and the testaceous mollusks formed his third order of that class, *Testacea*. Among the first we find *Tethys*, under which he arranged the *Holothuriæ*; and *Limax* and *Sepia*, which he placed near the *Hydræ*. The second were not yet divided into *Univalves* and *Bivalves*. The genera *Patella* and *Cochlea* seem to have embraced all the turbinated univalves; and *Cypræa*, *Haliotis*, and *Nautilus*, the simple univalves. All the *Bivalves* appear to be collected under the term *Concha*; and the *Ascidiæ*, under the name of *Microcosmus*, seem to have found a place under his *Testacea*.

It is in the tenth edition (1758) that we first trace considerable augmentations, which increased in the last that received the correction of the great Swedish naturalist's own hand, and which appeared in three volumes: the first part of the first volume being published in 1766; the second part of that volume, containing the *Insecta* and *Vermes*, in 1767; the second volume, containing the plants (*Regnum Vegetabile*), in 1767; and the third, containing the minerals (*Regnum Lapideum*), in 1768. Adanson's work was published at Paris in 1757, ten years before the second part of the second volume of the last edition of the *Systema Naturæ*. But Linnæus appears to have only profited by the labours of Guettard and Adanson to add to the genera of the orders *Mollusca* and *Testacea* of his *Vermes*, and to define them more closely. Geoffroy's publication appeared nearly at the same time with his own last edition. The object of Linnæus seems to have been to establish a nomenclature and form a system of conchology resting on the modifications of structure in the shell alone: in fact an arbitrary system which has now generally given way to systems founded upon more natural principles.

Pallas (*Miscellanea Zoologica*, 1766) seems to have been the first to point out the unsteady foundation on which the system of Linnæus rested. He shows that the subdivision of the testaceous mollusks, as adopted by Linnæus and his followers, resting on the shell only, without taking the animal into consideration, is far from natural; and, in that spirit of prophecy which is now fulfilled, he remarks that it cannot be preserved.

Bruguière, nevertheless, weighing the great influence which the system of Linnæus had exercised on zoology in general, and the powerful aid which it afforded to the student of that science, clung, in his *Dictionnaire des Vers*, to the method of the Swede in so many points that he may be said almost to have done little more than imitate him.

Bruguière admits the division of the two orders Molluscous Worms and Testaceous Worms. The first of these he subdivides into two sections, according to the presence or absence of *tentacula*, and consequently jumbles together a very heterogeneous mass of animals; for the same reason his second section is even more heterogeneous than the first. He however separates into a distinct order the *Echini* and *Star-fishes*.

In the second order, or that of *Testaceous Worms*, though the Linnæan principle is kept in view, the genera are more multiplied and their characters better defined; and as Bruguière is one of those authors who has greatly contributed to the advancement of this branch of zoology, we shall give an outline of his system of conchology.

He, like Linnæus, divides the *Testaceous Worms* into three sections, according to the number of the valves.

In the first (*Multivalves*) he places the *Chitons*, *Balanus*, and *Anatifa* (*Lepas* of Linnæus), *Teredo*, *Fistulana*, *Pholas*, *Char* (a new and imaginary genus), *Anomia*, and *Crania*. We here have for the first time a separation of the Pedunculated and Sessile types of the Cirripeds (*Campylosomata* and *Acamptosomata*) pointed out under the generic appellations of *Anatifa* and *Balanus*, and the new genera *Fistulana* and *Crania*.

The *Bivalves* (second section) are divided into the regular and irregular.

Among the *Regular Bivalves* are three new genera, viz. *Acardo, Placuna*, and *Perna*.

The *Irregular Bivalves* contain the new genera *Trigonia, Pecten* (previously separated from the oysters by Müller and Poli), *Tridacna, Cardita* (formed at the expense of *Chama*, Linn.), and *Terebratula*, containing a division of *Anomia*.

The *Univalves* are subdivided into the *Unilocular*, or those without any partitions, and the *Multilocular*, or those which are furnished with regular partitions or *septa*.

The *Unilocular Univalves without a regular spire* contain *Patella* and *Fissurella*, divided for the first time, and, notwithstanding the observations of Pallas, *Dentalium, Serpula, Siliquaria*, and *Aspergillum*, among others; *Fissurella, Siliquaria*, and *Aspergillum* being new.

The *Unilocular Univalves with a regular spire* present a less heterogeneous assemblage. We find among them *Voluta* reduced to a more uniform genus by withdrawing from it some of the widely different species which Linnæus had congregated under that name, and the following new genera: *Ovula* (or rather *Ovulum*), *Oliva, Purpura, Cassis, Terebra, Fusus, Cerithium, Bulimus, Planorbis*, and *Natica*.

The *Multilocular Univalves* not noticed by Linnæus, but pointed out by Breyn or Breynius of Danzig, in his *Dissertatio de Polythalamiis, nova Testaceorum Classe* (1732), comprise the genera *Camerina, Ammonites*, and *Orthoceras*, at the expense of the genus *Nautilus* of Linnæus.

Gmelin, whose edition of Linnæus appeared about the same time with the work of Bruguière, requires but little notice. Four or five new genera were added to the *Systema Naturæ*, which received in this edition a great number of species, too many of them added carelessly and in a manner to create confusion, instead of dissipating it.

In 1791 Poli published the first volume of his splendid work, *Testacea utriusque Siciliæ eorumque Historia et Anatome*. Of the care with which the details are wrought out, and the magnificence and accuracy with which they are illustrated, it is impossible to speak too highly. But while Poli avoids the errors of those who sought to establish a system of testaceous mollusks on the structure of the shell alone, he runs into the opposite extreme, and rests his arrangement on the soft parts of the animal only, without any reference to the hard part or shell. He divides the *Mollusca* into three orders:—1. *Mollusca brachiata* (*Sepiæ* &c. of Linnæus, and the *Tritons* and *Serpulæ* of the same author). 2. *Mollusca reptantia* (Gastropods of the more modern authors). 3. *Mollusca subsilientia* (Multivalves and Bivalves of the old school, and characterised as being provided with a long foot, as being fixed to rocks or free, and as always wanting a head and eyes).

Of these families the most natural are the Bivalves, and their arrangement is based upon the structure of important parts.

Little seems to have been done for the science from 1789 to 1798, a period which included the French revolution and its reign of terror; but in 1798 a new era commenced, and George Cuvier published his *Tableau Elémentaire de l'Histoire Naturelle des Animaux*. This great man, clearly perceiving that Guettard, Adanson, Geoffroy, Müller, and Poli took a right view of the principles of classification when they proposed the organization of the animal as its basis, adopted that method, and united, as Pallas had done, under the name of *Mollusca* both the *Vermes* (*Mollusca*) and *Vermes* (*Testacea*) of Linnæus. Considering the absence or presence of a shell as a contingency of secondary importance, he divided the Mollusca into three sections,—the *Cephalopodous Mollusca*, the *Gastropodous Mollusca*, and the *Acephalous Mollusca*. Finally he arranged this 'Second Grand Division of the Animal Kingdom' in six classes, and gave the following method in his last edition of the *Règne Animal* (1830).

MOLLUSCA.

Class I.

CEPHALOPODA.

1. *Sepia* of Linnæus, containing the following genera and subgenera: Octopus, Polypus, Eledone, Argonauta, Bellerophon, Loligo, Loligopsis, Onychoteuthis, Sepiola, Sepioteuthis, and the Cuttles properly so called, viz. Sepia of Lamarck.—2. *Nautilus* of Linnæus, containing Spirula, the Nautili properly so called (Nautilus pompilius, &c.), Lituus, Hortolus, and Orthoceras.—3. *Belemnites*, including Actinocomax?*.—4. *Ammonites*, including the Ammonites properly so called (Simplegades of De Montfort), Planites of De Haan, Ceratites, Orbulites, Globites, Goniatites, Pelagus, Scaphites, Baculites (Tiranites, Rhabdites, Icthyosarcolites), Hamites, Turrilites (the last with M. Audouin's doubt).—5. *Camerina* (Nummulites of Lamarck), with their infinity of genera. [FORAMINIFERA.]

Class II.

PTEROPODA.

1, *Clio*. 2, *Cymbulia*. 3, *Pneumodermon*. 4, *Limacina*. 5, *Hyalæa*. 6, *Cleodora*, including Creseis, Cuvieria, Psyche, and Eurybia, of M. Rang, and perhaps *Triptera* of Quoy and Gaimard. 7, *Pyrgo* (fossil).

Class III.

GASTEROPODA.

Order 1.

Pulmonifera.

§ 1.

Pulmonifera Terrestria.

1, *Limax*, including Limax properly so called. *Arion*. Vaginulus. Testacella and Parmacella. 2, *Helix*, including Helix properly so called. Vitrina (Helicolimax of Férussac). Bulimus. Pupa. Chondrus and Succinea. 3, *Clausilia*. 4, *Achatina* (including Polyphemus of De Montfort).

§ 2.

Pulmonifera Aquatica.

1, *Onchidium*. 2, *Planorbis*. 3, *Limnæus* or *Limnæa*. 4, *Physa*, near which Cuvier would place *Scarabus* of De Montfort. 5, *Auricula*, including Carychium of De Férussac. 7, *Melampus* (*Conovulus*, Lam.)

Order 2.

Nudibranchiata.

1, *Doris*. 2, *Onchidoris*. 3, *Plocamoceros*. 4, *Polycera*. 5, *Tritonia*. 6, *Thethys* or *Tethys*. 7, *Scyllæa*. 8, *Glaucus*. 9, *Laniogerus*. 10, *Eolidia*. 11, *Cavolina*. 12, *Flabellina*. 13, *Tergipes*. 14, *Busiris*. 15, *Placobranchus*.

Order 3.

Inferobranchiata.

1, *Phyllidia*. 2, *Diphyllidia*.

Order 4.

Tectibranchiata.

1, *Pleurobranchus*. 2, *Pleurobranchæa* (*Pleurobranchidium* of De Blainville). 3, *Aplysia*. 4, *Dolabella*. 5, *Notarchus*. 6, *Bursatella*. 7, *Akera*, including Bullæa, Bulla, and the Akeræ properly so called (Doridium of Meckel, and Lobaria of De Blainville). 8, *Gastropteron*. 9, *Umbrella*.

Order 5.

Heteropoda. (Lam.)

These were all comprised by Forskal under his genus Plerotrachea, and comprehend

1, *Carinaria*. 2, *Atlanta*. 3, *Firola*. 4, the *Timoriennes* of Quoy and Gaimard. 5, the *Monophores* of the same. *Phylliroe* of Péron is placed here, but with doubt.

Order 6.

Pectinibranchiata.

Family of Trochöids.

1, *Trochus* (including Tectus, Calcar, Rotella, Cantharidus, Infundibulum, Telescopium, Solarium, and Euomphalus). 2, *Turbo*, including, as genera and subgenera, Turbo properly so called (which comprises both Turbo and Meleagris of De Montfort), Delphinula, Pleurotomaria, Turritella, Scalaria; together with certain terrestrial and fresh-water subgenera, viz.: Cyclostoma, Valvata, and Paludina; and the following: Littorina, Monodon, Phasianella, Ampullaria (including Lanistes of De Montfort), Helicina, Melania, Rissoa, Melanopsis, Pirena, Acteon (Tornatella, Lam.), Pyramidella, Janthina, Nerita, Natica, Peloronta, Velates, Neritina, and Clithon.

Family of Capulöids.

1, *Capulus* (Pileopsis of Lamarck). 2, *Hipponyx*. 3, *Crepidula*. 4, *Pileolus*. 5, *Navicella* (Cimber of De Montfort). 6, *Calyptræa*. 7, *Siphonaria*. 8, *Sigaretus*. 9, *Coriocella*. 10, *Cryptosoma*.

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[*] In the text Actinocomax is included in the section appropriated to the genus Belemnites, though it is spoken of as a genus. In the 'Table Méthodique' Actinocomax is printed as a genus, not a subgenus.

Family of Buccinoids.

1, *Conus*. 2, *Cypræa*. 3, *Ovula*, or rather *Ovulum*, including Volva (Radius?) and Calpurnus of De Montfort. 4, *Terebellum*. 5, *Voluta*, including Oliva, Volvaria, the true Volutæ (subdivided by Broderip* into Cymba—Cymbium of De Montf.—Melo, and Voluta), Marginella, Columbella, Mitra, and Cancellaria. 6, *Buccinum*, including Buccinum of Bruguière, Nassa, Eburna, Ancillaria, Dolium (the Tuns, and Partridge Tuns), Harpa, Purpura, Unicornus (Monoceros, Lam.), Ricinula (Sistrum of De Montf.), Concholepas, Cassis, Cassidaria (Morio of De Montf.), and Terebra. 7, *Cerithium* (including Potamides). 8, *Murex*, including Murex, Brug., which comprises the Murices properly so called (Murex, De Montf.), and Brontes, Typhis, Chicoreus, Aquillus, Lotorium, Triton, and Trophon of the same; Ranella (including Apollon of De Montf.); Fusus (including Fusus and Latirus of De Montf.); Struthiolaria; Pleurotoma; Clavatula; Pyrula (including Fulgur of De Montf.), and Fasciolaria. 9, *Strombus* (including Strombus, Lam., Pteroceras, Rostellaria, and Hippochrenes).

Order 7.

Tubulibranchiata.

1, *Vermetus*, including Vermilia. 2, *Magilus*. 3, *Siliquaria*.

Order 8.

Scutibranchiata.

1, *Haliotis*, including Padollus as a subgenus, and Stomatia. 2, *Fissurella*. 3, *Emarginula* (Palmarium of De Montfort). 4, *Parmophorus* (Scutus of De Montfort).

Order 8.

Cyclobranchiata.

1, *Patella*. 2, *Chiton*.

Class IV.

ACEPHALA.

Order 1.

Acephala Testacea (with four branchial *feuillets*, or leaflets).

Family of Ostraceans.

1, *Acardo*,† Brug., or *Ostracites*, La Peyrouse, including Radiolites, Sphærulites, Calceola, Hippurites, and Batolites. 2, *Ostrea*, Linn., including Ostrea, Brug., Gryphæa, Pecten, Lima, and Pedum. 3, *Hinnites*. 4, *Plagiostoma*. 5, *Pachytes*. 6, *Dianehora*. 7, *Podopsis*. 8, *Anomia*. 9, *Placuna*. 10, *Spondylus*, from which Lamarck has separated Plicatula. 11, *Malleus*. 12, *Vulsella*. 13, *Perna*, from which have been separated Crenatula, Gervillia, Inoceramus, Catillus, and Pulvinites. 14, *Etheria*. 15, *Avicula*, including Margarita. 16, *Pinna*. 17, *Arca*, Linn., including Arca, Lam., Cucullæa, Pectunculus, and Nucula. 18, *Trigonia*.

Family of Mytilaceans.

1, *Mytilus*, Linn., including Modiola and Lithodomus 2, *Anodon*, including Iridina, Dipsas, &c. 3, *Unio*, including Hyria and Castalia. 4, *Cardita*. 5, *Cypricardia*, and the *Coralliophaga* of M. de Blainville, *Venericardia*, and *Crassatella* (Paphia, Roiss.).

Family of Chamaceans.

1, *Chama*, Linn., including Tridacna, Hippopus, Chama (Brug.), Diceras, and Isocardia.

Family of Cardiaceans.

1, *Cardium*, including Hemicardium. 2, *Donax*. 3, *Cyclas*, including Cyrena, Cyprina, and Galathæa. 4, *Corbis*, Cuv., *Fimbria*, Megerle. 5, *Tellina*. 6, *Loripes*. 7, *Lucina*. 8, *Ungulina*. 9, *Venus*, including Astarte (Crassina, Lam.), Cytheræa, Capsa, and Petricola. 10, *Corbula*. 11, *Mactra*.

Family of the Enfermés.

1, *Mya*, including Lutraria, Anatina, Solemya, Glycymeris, Panopea, and Pandora. 2, *Byssomya*. 3, *Hiatella*. 4, *Solen*, including Sanguinolaria, Psammobia, and Psammothea. 5, *Pholas*. 6, *Teredo*. 7, *Fistulana*. 8, *Gastrochæna*. 9, *Teredina*. 10, *Clavagella*. 11, *Aspergillum*.

Order 2.

Acephala without shells.

1st Family (Simple).

1, *Biphora*, including Thalia, Salpa, and Dagysa. 2, *Ascidia*, including Cynthia, Phallusia, Clavellina, and Boltenia.

2. Family (Aggregate).

1, *Botryllus*. 2, *Pyrosoma*. 3, *Polyclinum*.

Class V.

BRACHIOPODA.

1, *Lingula*. 2, *Terebratula*, including Spirifer and Thecidea. 3, *Orbicula*, including Discina and Crania.

Class VI.

CIRRHOPODA.

(Lepas and Triton, Linn.)

1, *Anatifa*, including Pentalasmis, Pollicipes, Cineras, Otion, and Tetralasmis. 2, *Balanus*, including Acasta, Conia, Asema, Pyrgoma, Ochthosia, Creusia, Coronula, Tubicinella, and Diadema.

Such is the method finally proposed by Cuvier; and, while perusing it, the reader should remember that he had the advantage of reference to almost every author of note who had written on the subject, down to the year 1830. Not that this at all detracts from the excellent use which he has made of the materials at his command, and the grand philosophical views which he took of this intricate department of zoology.

We must now go back to 1798, when Lamarck began his publications on the Mollusca, by a paper in which he separated the great genus Sepia into three genera; and in 1799 he gave to the world his *Prodromus* of a new classification of shells, wherein he established several new genera. In this work he states his adhesion to the principles and views of Bruguière, whilst profiting by the observations of Cuvier as to the organization of the animals, but remarks that he has been compelled to restrict still more the characters of the genera, and consequently to augment their number. In 1801, when he published his *Animaux sans vertèbres*, he seems to have been convinced of the justice of the views of Cuvier; and no longer confining his attention to the shells, he followed very nearly the example of that great zoologist, and rested his system upon the organization of the soft parts, as well as on the form of the shell of the animal. The 1st vol. of the last edition, which received the corrections of Lamarck's own hand, was published in 1815, and the last vol. in 1822:* the following is the arrangement left by him.

Before we enter upon that part of the system which in strictness belongs to the subject before us, it will be necessary to give a succinct view of Lamarck's *Annelids*. These he divides into three orders:—

I. The Apod Annelids, containing the *Hirudinidæ* or Leeches, and the *Lumbricidæ* or Worms (Echiurées).

II. The Antennated Annelids, containing the *Aphroditidæ*, the *Nereididæ*, the *Eunicididæ*, and the *Amphinomidæ*.

III. The Sedentary Annelids, containing the *Dorsalidæ*, which include Arenicola and Siliquaria; the *Maldanidæ*, which include Clymene and Dentalium; the *Amphitritidæ*, which comprise Pectinaria, Sabellaria, Terebella, and Amphitrite, and the *Serpulidæ* (Spirorbis, Serpula, Vermilia, Galeolaria, and Magilus).

The *Annelids* immediately precede Lamarck's Class I.

CIRRHIPEDES.

Order 1.

Sessile Cirrhipedes.

§ 1. With a quadrivalve operculum.

Genera:—Tubicinella. Coronula. Balanus. Acasta.

§ 2. With a bivalve operculum.

Pyrgoma. Creusia.

Order 2.

Pedunculated Cirrhipedes.

§ 1. Body completely enveloped by its tunic. Shell composed of contiguous pieces, leaving a free issue to the animal when they are opened.

Anatifa. Pollicipes.

§ 2. Body completely enveloped by its tunic, which nevertheless has an anterior opening. Shell formed of separate pieces, which have no need to open themselves for the issue of the arms of the animal.

Cineras. Otion.

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* In the 'Règne Animal,' 'Sowerb.' is erroneously printed for 'Brod.'

† species figured by Brug., 'Encyclop.,' pl. 173, ff. 1, 2, 3, appears to be double epiphysis of the vertebræ of a Cetacean.

* There is another edition of Lamarck's 'Animaux sans vertèbres,' now (1839) in a course of publication, with valuable notes and additions by MM. Deshayes and Milne Edwards.

Class XI.

CONCHIFERA.

Orde: 1.

Conchifera Dimyaria.

uscles of attachment at least. Shell, internally, muscular impressions, which are separate and

ell regular, generally equivalve.
ell gaping, in general, at the lateral extremities, being approximated.
assipede Conchifers.—Mantle with its lobes united , either entirely or partially; foot thick posterior: he shell always remarkable, often considerable.
ell either contained in a tubular sheath, distinct alves, or entirely or partially incrusted in the wall eath, or projecting externally.

Family Tubicolidæ†.

illum. Clavagella. Fistulana. Septaria. Teredina.

ell without a tubular sheath.
gament external.
ell either furnished with accessory pieces, foreign alves, or gaping very much anteriorly.

Family Pholadidæ.

. Gastrochæna.
hell without accessory pieces, and gaping at the tremities only.

Family Solenidæ.

Panopæa. Glycymeris.
ament internal.

Family Myidæ.

Anatina.
enuipede Conchifers.—Mantle with its lobes not hardly united anteriorly; foot small, compressed; the shell often considerable.
gament internal.

Family Mactridæ.

gament internal only.
ell gaping on its sides.
a. Mactra.
ll not gaping at its sides.
ella. Erycina.
gament visible externally, or double, one part be- al, the other external.
na. Solemya. Amphidesma.

Family Corbulidæ.

inequivalve. Ligament internal.)
a. Pandora.
igament external only.

Family Lithophagidæ.

shells without accessory pieces, without any par- eath, and more or less gaping at their anterior gament of the valves internal.
a. Petricola. Venerupis.

Family Nymphidæ.

rdinal teeth at most in the same valve. Shell ing a little at the lateral extremities. Ligament Nymphs, in general, gaping outwards.
en-like Nymphidæ.
nolaria. Psammobia. Psammotæa.
llen-like Nymphidæ.
eral teeth, one or two.
Tellinides. Corbis. Lucina. Donax.
lateral teeth.
Crassina.
ell closed at the lateral extremities, when the closed.
Lamellipede Conchifers. Foot flattened, lamelli- posterior.

Family Conchidæ.

cardinal teeth at least in one valve, with as many the other. Lateral teeth sometimes.
viatile Conchidæ.
Shell with lateral teeth, and covered with a false epidermis.
Cyclas. Cyrena. Galathea.
2. Marine Conchidæ.
No lateral teeth in the greater number; rarely an epidermis, which covers the whole shell except the umbones.
Cyprina. Cytherea. Venus. Venericardia.

Family Cardiidæ.

Cardinal teeth irregular, either in their form or situation, and accompanied, in general, by one or two lateral teeth.
Cardium. Cardita. Cypricardia. Hiatella and Isocardia.

Family Arcidæ.

Cardinal teeth small, numerous, intrant, and disposed in each valve on a line which is either straight, or arched, or broken.
Cucullæa. Arca. Pectunculus. Nucula. Trigonia and Castalia.

Naiidæ.

Fluviatile shells, whose hinge is sometimes furnished with an irregular cardinal tooth which is simple or divided, and with a longitudinal tooth which is prolonged under the corselet; and sometimes is without any tooth at all, or is furnished along its length with irregular, granulous tubercles.
Muscular impression posterior and compound. Umbones with the epidermis peeled off, and frequently eroded.
Unio. Hyria. Anadonta (or rather Anodon) and Iridina.
(****) *Ambiguous Conchifers.*

Family Chamidæ.

Shell irregular, inequivalve. A single cardinal tooth which is oblique and subcrenate, inserted into a little pit in the opposite valve.
Muscular impressions two, distant, lateral. External ligament depressed.
Diceras. Chama. Etheria.

Order 2.

Conchifera Monomyaria.

Only one muscle of attachment, which seems to traverse their body.
Shell with an internal subcentral muscular impression.
(*) Ligament marginal, elongated on the border, sublinear.
(*a*) Shell transverse, equivalve, with an elongated muscular impression, bordering the upper limb.

Family Tridacnidæ.

Tridacna. Hippopus.
(*b*) Shell longitudinal or subtransverse, with a muscular impression contracted into an isolated space without bordering the limb.
(†) Ligament at the lateral border of the shell, and always entire.

Family Mytilidæ.

Hinge with a subinternal ligament, which is marginal, linear, very entire, occupying a great part of the anterior border. Shell rarely foliated.
Modiola. Mytilus. Pinna.
(††) Ligament at the lower border of the shell, or divided.

Family Mallëidæ.

Ligament marginal, sublinear, either interrupted by crenulations or serial teeth, or altogether simple. Shell subinequivalve, foliated
Crenatula. Perna. Malleus. Avicula. Meleagrina.
(**) Ligament not marginal, contracted into a short space under the umbones, and not forming a tendinous tube under the shell
(*a*) Ligament internal or demi-internal. Shell regular, compact, not foliated.*

Family Pectinidæ.

Pedum. Lima. Plagiostoma. Pecten. Plicatula. Spondylus. Podopsis.
(*b*) Ligament internal or demi-internal. Shell irregular, foliated, sometimes papyraceous.

Family Ostreidæ.

(1) Ligament demi-internal, shell foliated, but nevertheless often acquiring great thickness.

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k does not use the termination 'idæ;' but it is now so generally zoology to designate family names, that we have thought it adopt the form for the Lamarckian families.

* The term foliated is here applied as relating to the structure of the shell itself, rather than to the external excrescences.

Gryphæa. Ostrea. Vulsella.

(2) Ligament internal. Shell delicate, papyraceous.

Placuna. Anomia.

(***) Ligament either null or unknown, or represented by a tendinous chord which sustains the shell.

(*a*) Ligament and animal unknown. Shell very inequivalve.

Family Rudistidæ.

Sphærulites. Radiolites. Calceola. Birostrites. Discina. Crania.

(*b*) Shell adherent, either immediately or by a tendinous chord which sustains it, and serves as a ligament. Animal with two opposed arms, which are opposed, ciliated, and cirrhous.

Family Brachiopodidæ.

Conchifers having near the mouth two opposed, elongated, ciliated arms, rolled spirally when in repose. Mantle bilobated, the lobes separated anteriorly, enveloping or covering the body.

Shell bivalve, adhering to marine bodies, either immediately or by a tendinous chord.

Orbicula. Terebratula. Lingula.

Class XII.

MOLLUSCA.

Order 1.

Pteropoda.

No foot for creeping, nor arms for progress or seizing the prey. Two fins opposed and similar, proper for natation. Body free and floating.

Hyalæa. Clio. Cleodora. Limacina. Cymbulia. Pneumodermon.

Order 2.

Gasteropoda.

Animals with a straight body, never spiral nor enveloped in a shell which can contain the entire animal; having under the belly a foot or muscular disc united to the body nearly throughout its length, and serving for creeping.

Some naked, others protected by a dorsal shell, not imbedded; and others, on the other hand, containing a shell more or less hidden in their mantle.

1st Section.

Hydrobranchiata.

Branchiæ, whatever be their position, elevated either in a net-work, in laminæ, in a pectinated form, or in a ribbon-like shape. The animals of this section breathe water only.

(*a*) Branchiæ external, placed above the mantle, either on the back or on the sides, and being in no particular cavity.

Family Tritonidæ.

Glaucus. Eolis. Tritonia. Scyllæa. Tethys. Doris.

(*b*) Branchiæ placed under the border of the mantle, and disposed in a longitudinal series round the body, or on one side only; not being in any particular cavity.

Family Phyllididæ.

Phyllidia. Chitonellus. Chiton. Patella.

Family Semiphyllididæ.

Branchiæ placed under the border of the mantle, and disposed in a longitudinal series on the right side of the body only.

Pleurobranchus. Umbrella.

(*c*) Branchiæ placed in a particular cavity upon the back, situated anteriorly near the neck. Shell always external, and covering the soft parts.

Family Calyptræidæ.

Parmophorus. Emarginula. Fissurella. Pileopsis. Calyptræa. Crepidula. Ancylus?

(*d*) Branchiæ placed in a particular cavity towards the posterior part of the back, and covered either by the mantle or by an opercular escutcheon.

(†) No tentacula.

Family Bullidæ.

Akera. Bullæa. Bulla.

(††) With tentacula.

Family Laplysidæ.

Laplysia. Dolabella.

2nd Section.

Pneumobranchiata.

Branchiæ creeping, in the form of a vascular net-work, on the wall of a particular cavity, the aperture of which is a hole which the animal contracts or dilates at its pleasure. Animals of this section breathe nothing but air.

Family Limacidæ.

Onchidium. Parmacella. Limax. Testacella. Vitrina.

Order 3.

Trachelipoda.

Body spiral in its posterior part, this part being separated from the foot, and always enveloped in the shell. The foot free, flattened, attached to the lower base of the neck, or to the anterior part of the body, and serving for creeping. Shell spirivalve and sheathing (engainante).

Section I. (Phytiphagous.)

Trachelipods without a projecting siphon, and respiring in general by means of a hole. The greater part *phytiphagous* and furnished with jaws. Shell with the aperture entire, having at its base neither dorsal subascending notch nor canal.

* Trachelipods respiring air only. Shell spirivalve, unarmed (mutique), not distinctly nacreous.

Family Colimacidæ (terrestrial).

(*a*) Four tentacles.

Helix. Carocolla. Anostoma. Helicina. Pupa. Clausilia. Bulimus. Achatina. Succinea.

(*b*) Two tentacles.

Auricula. Cyclostoma.

Family Limnæidæ.

Amphibious. Living in the water, but coming to the surface to breathe. Shell with a sharp edge to the lip.

Planorbis. Physa. Lymnæa, or rather Limnæa.

(**) Trachelipods breathing water only. Branchiæ projecting in form of filaments, laminæ or tufts in the branchial cavity. Shell often nacreous, and often also having protuberant parts on the surface.

(*a*) Shell fluviatile, operculated, the left border of which does not resemble a demi-partition.

(†) Shell with disunited borders.

Family Melanidæ.

Melania. Melanopsis. Pirena.

(††) Shell with united borders.

Family Peristomidæ.

Valvata. Paludina. Ampullaria.

(*b*) Shell fluviatile or marine, whose left border or lip resembles a demi-partition.

Family Neritidæ.

Navicella. Neritina (fluviatile). Nerita. Natica (marine).

(*c*) Shell marine, whose left lip does not resemble a demi-partition.

(†) Shell floating at the surface of the water.

Family Janthinidæ.

Janthina.

(††) Shell not floating, having the aperture very wide; no columella.

Family Macrostomidæ.

Sigaretus. Stomatella. Stomatia. Haliotis.

(†††) Aperture without any particular width; plaits on the columella.

Family Plicacidæ.

Tornatella. Pyramidella.

(††††) No plaits on the columella.

(*a*) Borders of the aperture united circularly.

Family Scalaridæ.

Vermetus. Scalaria. Delphinula.

(*b*) Borders of the aperture disunited.

Family Turbinidæ.

Solarium. Rotella. Trochus. Monodonta, or rather Monodon. Turbo. Planaxis. Phasianella. Turritella.

Section II. (Zoophagous.)

Trachelipods with a projecting siphon, and which only breathe the water which arrives at the branchiæ by means of this siphon. These feed on animal substances only, are marine, have no jaws, and are furnished with a retractile proboscis.

Shell spirivalve, sheathing the soft parts, with an aperture which is either canaliculated, or notched, or turned up at its base.

(*a*) Shell with a canal more or less long at the base of its aperture, and the right border of whose lip does not change with age.

Family Canaliferidæ.

§ 1.

istant *bourrelet* on the right lip of the species.
um. Pleurotoma. Turbinella. Cancellaria. Fas-
Fusus. Pyrula.

§ 2.

tant *bourrelet* on the right lip in all the species.
bourrelet on the spire.

Struthiolaria.

urrelets on the spire.
a. Murex. Triton.
ell with a canal more or less long at the base of
re, and the right border of whose lip changes its
age, and has a sinus inferiorly.

Pteridæ (Ailées or Wing-shells).

aria. Pterocera, or rather Pteroceras. Strombus.
ll with a short canal, ascending posteriorly, or
blique notch at the base of its aperture, this demi-
g directed towards the back.

Family Purpuridæ (Purpurifères).

§ 1.

ending canal, or recurved towards the back.

Cassidaria. Cassis.

§ 2.

ique notch directed backwards.
a. Purpura. Monoceros. Concholepas. Harpa.
Buccinum. Eburna. Terebra.
canal at the base of the aperture, but a subdorsal
plaits on the columella.

Family Columellidæ (Columellaires).

ella. Mitra. Voluta. Marginella. Volvaria.
ell without a canal, but having the base of its
notched or versant, and the whorls of the spire
pressed, and enrolled in such a manner that the
nearly entirely covers the others.

Family Convolutidæ (Enroulées).

or rather Ovulum. Cypræa. Terebellum. An-
Oliva. Conus.

Order IV.

Cephalopoda.

in form of a sac, containing the lower part of the
ead projecting from the sac, surrounded by arms,
e not articulated, but furnished with suckers
s), and which environ the mouth. Two sessile
horny mandibles to the mouth; three hearts;
rate.

1st Division.

Polythalamous Cephalopods.

ultilocular, enveloped completely or partially, and
enclosed in the posterior part of the animal, often
rence.

Shell multilocular, with simple chambers.

Shell straight or nearly straight: no spiral.

Family Orthoceratidæ.

ites. Orthoceras. Nodosaria. Hippurites. Co-

ell partially spiral: last whorl continued in a
ne.

Family Lituolitidæ.

Spirula. Spirolina. Lituola.

(3). Shell semi-discoid: spire eccentric.

Family Cristacidæ.

Renulina. Cristellaria. Orbiculina.

ell globulose, spheroidal, or oval, with enveloping
partitions united *en tunique*.

Family Spherulidæ.

Miliola. Gyrogona.* Melonia.

ell discoid, with a central spire, and partitions
from the centre to the circumference.

Family Radiolididæ.

Rotalia. Lenticulina. Placentula.

ell discoid, with a central spire, and partitions
not extend from the centre to the circumference.

Family Nautilidæ.

is. Siderolites. Polystomella. Vorticialis. Num
Nautilus.

** Shell multilocular, with chambers pinked (decoupés) at the edges.

Family Ammonitidæ.

Ammonites. Orbulites. Ammonoceras. Turrilites. Baculites.

2nd Division.

Monothalamous Cephalopods.

Shell unilocular, entirely external, and enveloping the animal.

Genus, Argonauta.

3rd Division.

Sepiary Cephalopods.

No shell, either internal or external. A solid free cretaceous or horny body, contained in the interior of the greater part of the animals.

Genera:—Octopus. Loligopsis. Loligo. Sepia.

Order V

Heteropoda.

Body free, elongated, swimming horizontally. Head distinct; two eyes. No arms surrounding the head; no feet under the belly or under the throat for creeping. One or more fins, without any regular order, and not disposed by pairs.

Genera:—Carinaria. Pterotrachea. Phylliroë.

Such was Lamarck's arrangement, as he finally left it, after various modifications in the course of his publications, from the commencement of them to the second edition of his 'Animaux sans vertèbres.' During that interval many authors had presented their views to the public, and we proceed to notice some of them.

In 1800, M. d'Audebard de Férussac (the father) produced a system of Conchology based on the consideration of the animal and its shell. He introduced some observations on the complete or incomplete state of what he calls the 'spiral cone' of the shell, and the point of attachment of the foot, under the neck or under the belly of the Gastropods. His views were limited to the terrestrial and fluviatile Mollusks, or 'Musculites,' as he calls them, and subdivides them into orders almost as numerous as his genera, among which we find *Helicolimax*, forming the passage between the *Limaces* and the *Helices*.

The work of M. Bosc, in the supplements to Buffon (Det., 1802), may be considered as rather of a retrograde character, for it still clung to the system of Linnæus as amended by Bruguière; and, notwithstanding the progress already made, we find him adhering to the terms *Molluscous Worms* and *Testaceous Worms*, as designating the *Naked* and *Testaceous Mollusca*. His divisions were nearly those of Bruguière, though he adopted the new subdivisions which Cuvier and Lamarck had established, and appears to have been conscious of the value of those innovations. Bosc was an observer, and had studied many of the *Mollusca* in a living state. He established many new facts and some new genera.

In 1803 appeared the *Prodromus* of the work of Draparnaud, which was not published till after his death in 1808, on the Terrestrial and Fluviatile Mollusca of France. This work is conceived and executed in a philosophical spirit, and with rational views of a natural system of classification. He abandoned the arbitrary method of Linnæus, and returned to the principle proposed by Réaumur (1711) in his 'Memoir on the Progressive Motions of Shells,' making his classification that of Cuvier.

The 'Natural History of Mollusca,' for Sonnini's edition of Buffon, was hardly commenced by Denys de Montfort, and almost entirely executed by M. de Roissy. The classification is carried out on the principles of Cuvier, but the author differs from Cuvier on some points, as, for instance, in thinking that the section of the Anodons ought not immediately to follow that of the Oysters, and that the aperture which Cuvier regarded as anterior in Biphora was really posterior—an opinion in which he is supported by MM. Bosc, Péron, De Blainville, Chamisso, and Kuhl. In this work the analogy of the Polythalamous or chambered shells is pointed out. M. de Roissy appears to have perceived the passage from the Univalve to the Bivalve Mollusks by means of the *Patellæ*, and he seems to have been the first who placed *Aspergillum* near to *Fistulana*, a position which it still holds.

M. Duméril, in 1806, published in his 'Zoologie Analy tique' a classification of *Mollusca* nearly similar to that of Cuvier. M. Duméril divides the *Mollusca* into five orders: *Cephalopoda, Pteropoda, Gasteropoda, Acephala,* and *Brachiopoda.* The principal novelties in this publication were a division of the *Gasteropoda,* according to their organs of respiration, into three families—*Dermobranchiata, Siphonobranchiata,* and *Adelobranchiata*—which correspond nearly to the three divisions established on the structure of the shell; and a separation of the *Brachiopoda* as a distinct order.

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* A seed.

In 1808 Denys de Montfort published his *Univalves Cloisonnées,* and in 1810 the second volume of his *Conchyliologie Systematique,* containing the *Univalves non Cloisonnées.* His genera are very numerous, and not many of them are retained at present by zoologists, though they are for the most part neatly defined. His method is only carried out with regard to the Univalves; but his primary division rests upon the number of valves, and is separated into *Univalves. Multivalves,* and *Bivalves,* as in the systems of the older conchologists. He differs however in restricting the term *Multivalves* to shells made up of several united pieces, without any solution of continuity; whilst he applies the term *Dissivalves* to shells made up of many pieces, but not coherent nor adherent to each other, as *Teredo, Fistulana, Balanus,* &c.

Oken, in 1810, read to the society of Gottingen a paper upon the knowledge of Mollusca apart from their shells and upon a natural classification established upon this basis; and carried out this principle in his 'Manual of Nat. Hist.,' published at Jena in 1816. Our limits will not allow us to do more than call the reader's attention to this work, which he will find well worthy of perusal, though it does not contain any new principle of arrangement, and there is somewhat too much of change of name about his genera, of which there are but few really new; nor can we do more than hint at the work of M. Rafinesque (Palermo, 1814). About the year 1816 much light was thrown on the *Aggregated Mollusca* by Lesueur, Desmarest, and above all by the great Savigny, and in 1817 M. de Blainville first made known the principles of his system, which he afterwards carried out to its completion, and to which we shall call attention in the proper place. The systems of Goldfuss and Ranzani appeared in the same year, 1820, the first at Nuremberg and the second at Bologna; the first may be regarded as a compilation of the labours of those malacologists who had embraced the natural system; and the basis of the second, as far as the Cirrhipeds are concerned, rests on the structure of the shell and its operculum without regard to the animal, and, as far as relates to the acephalous mollusks, does little more than give new denominations to the four sections of that division.

M. de Férussac (the son) divided (1819) the Mollusca into two grand sections, the *Cephalous* and the *Acephalous.*

Cephalous Mollusca.

These are divided into three classes—Cephalopods, Pteropods, and Gastropods.

The first class, *Cephalopods,* contained the two orders, Decapods and Octopods, as in the arrangement of Dr. Leach. This class in the system of De Férussac embraces all the naked cephalopods and all the animals with multilocular shells; but was subsequently considerably modified in a joint work with M. d'Orbigny.

The second class, *Pteropods,* which originally consisted of the families Hyalææ, Limacinæ, the Clios, the Pneumoderms, and the Phyllirhoes, also underwent considerable changes in a subsequent and joint work with M. Rang.

The third class, *Gastropods,* are divided into the following orders and suborders:—1. Nudibranchians (Anthrobranchians and Polybranchians). 2. Inferobranchians (Phillidians and Semi-phillidians). 3. Tectibranchians. 4. Pulmonians without an operculum (Geophilians, Gehydrophylians, and Hygrophilians). 5. Operculated Pulmonians. 6. Pectinibranchians (Pomastomes, Hemipomastomes, Apomastomes, and Adeloderms). 7. Scutibranchians Ormiers, (Haliotis, &c.), Calyptracians, Heteropods. 8. Cyclobranchians (Chismobranchians and Polyplaxiphores).

Acephalous Mollusca.

These are divided into four classes—Cirripedes, Brachiopods, Lamellibranchians, and Tuniciers.

The first, *Cirripedes,* is divided into the orders—Sessile Cirripedes and Pedunculated Cirripedes.

The second, *Brachiopods,* contains the three families Lingulidæ, Terebratulidæ, and Cranidæ.

The third, *Lamellibranchians,* comprehends five orders—the Ostraceans, Mytilaceans, Benetiers (Tridacna and Hippopus), the Cardiaceans, and the Enfermés (Myidæ, Solenidæ, Pholidæ, and Tubicolidæ).

The fourth, *Tuniciers,* consists of the two orders Tethid Ascidians (Tethidæ and the Pyrosomes) and Thalid Ascidians (Biphora, &c.).

In England Dr. Leach had been active in introducing a natural system, as appears from his published papers, descriptions, and works. He had it in contemplation to publish a general history of English Mollusca; but the most distressing of maladies deprived zoology of one of its most zealous cultivators, and the work has never appeared.

Mr. Gray (John Edward) published in the *London Medical Repository* (1821), his system, which divides the Mollusca (taken in the largest sense of the word) into seven classes.

The first, *Antliobrachiophora* (Cephalopods) consists of three orders—Anosteophora, Sepiæphora, and Nautilophora.

The second, *Gasteropodophora,* is divided into three subclasses—*Pneumobranchia, Cryptobranchia,* and *Gymnobranchia.*

The first of these *subclasses* contains two orders—Adelopneumona and Phaneropneumona. The second embraces nine orders—the Ctenobranchia, which are divided into six sections by the application of a new principle, viz. the form of the operculum: the Trachelobranchia; the Monopleurobranchia; the Notobranchia; the Chismatobranchia; the Dicranobranchia; the Cyclobranchia; the Polyplacophora; and the Dipleurobranchia. The third *class* consists of two orders—Pygobranchia and Polybranchia.

Mr. Gray's third class, *Gasteropterophora,* corresponds with the Heteropoda of Lamarck, and is similar to M. de Blainville's order Nucleobranchiata.

The fourth class, *Stomatopterophora,* corresponding with the Pteropoda, contains two orders, Pterobranchia and Dactyliobranchia.

The fifth class, *Saccophora* (Tuniciers of Lamarck), consists of three orders—Holobranchia, Tomobranchia, and Diphyllobranchia.

The sixth, *Conchophora,* consists of orders depending on the number of muscular impressions, and denominated from the form of the foot, as Cladopoda, Leptopoda, Phyllopoda, Pogonopoda, and Micropoda.

The seventh, *Spirobrachiophora,* corresponds with the Brachiopoda.

M. de Blainville, who in 1814 had published his first sketch of a methodical arrangement of the *Malacozoa,* as he designates the animals on which we are treating, still further developed that method in 1817 in his 'Prodromus' of a general classification of the animal kingdom. The organ upon which that arrangement is based is the organ of respiration, and it was finally perfected in the method which appeared in his 'Manuel de Malacogie,' (1825). We here give an outline of it.

Type.

MALACOZOA.

Class I. Cephalophora.

Order 1.

Cryptodibranchiata.

Family 1. Octocera, containing the genus Octopus, which includes Eledone (Leach) and Ocythöe (Rafinesque).

Family 2. Decacera, including the genus Loligo (Sepiola and Cranchia, Leach. Onychoteuthis, Lichtenst., the Sagittated Calamaries, Pteroteuthis, Sepioteuthis) and the genera Sepia. Beloptera.

Order 2.

Cellulacea.

Family 1. Spherulacea, consisting of the genus Miliola (including Pollontes of De Montfort), Melonia (including Borelis of De Montfort), Saracenaria, and Textularia.

Family 2. Planulacea, comprising Renulina, including Frondicularia of Defrance; and Peneroplis, including Planularia of Defrance.

Family 3. Nummulacea, containing Nummulites, including Lycophris of De Montf.; Helicites, including Rotalites and Egeon of De Mont.; Siderolites, including Tinoporus and Siderolithes of De Montf.; Orbiculina, including llotes, Helenis, and Archaias of the same; Placentula, including Eponides and Florilus of the same; and Vorticialis, including Themeon, Sporilus, and Andromedes of the same.

Order 3.

Polythalamacea.

Family 1. Orthocerata. *Genera* * (with simple chambers or partitions), Belemnites, including Callirhöe, Hibolithes, Porodragus, Cetocis, Acamas, and Paclites of De Montf.; Conularia; Conilites, including Achelois, Amimonus, and Thalamus of the same; Orthoceras, including Nodosaria (Lam.); Reophax, and Molossus of De Montf. ** (with sinuous chambers), Baculites, including Tiranites of the same.

Family 2. Lituacea. *Genera* * (with simple chambers), Ichthyosarcolithes; Lituola; Spirula, including Hortolus and Lituites of De Montf., and Spirolina of Lam. ** (with sinuous chambers), Hamites and Ammonoceratita.

Family 3. Cristacea. *Genera*, Crepidulina, including Astacolus, Cancris, and Periples of De Montf.; Oreas; and Linthuris.

Family 4. Ammonacea. *Genera*, Discorbites; Scaphites; Ammonites; and Simplegas, including Ammonites, Planulites, and Amaltheus of De Montf.

Family 5. Nautilacea. *Genera*, Orbulites, including Aganides and Pelagus of De Montf.; Nautilus, including Angulithes, Oceanus, and Bisiphytes of the same; Polystomella, including Geophonus, Pelorus, Elphidium, Phonemus, Chrysolus, and Melonis of the same; Lenticulina, including Patrocles, Nonion, Macrodites, Robulus, Lampas, Pharamum, Antenor, Clisiphontes, Rhinocurus, Herion, and Spincterules of the same.

Family 6. Turbinacea. *Genera*, Cibicides; Rotalites, including Storilus, Cidarollus, and Cortalus of De Montf.

Family 7. Turriculacea. *Genus*, Turrilites.

Class II.

Paracephalophora.

Subclass I.

Paracephalophora Dioica (Aquatic, but capable of living for some time out of water).

§ 1.

Organs of respiration, and shell non-symmetrical, and almost constantly turned spirally from left to right.

Order 1.

Siphonobranchiata.

Family 1. Siphonostomata (Murex, Linn.). *Genera* * (no persistent bourrelet on the right lip), Pleurotoma, including Clavatula, Lam.; Rostellaria, including Hippochrenes of De Montf.; Fusus, including Latirus of De Montf.; Pyrula, including Fulgur of De Montf., and Melongena and Rapana of Schum.; Fasciolaria; Turbinella, including Polygonum of Schum.; Triton, including Lotorium, Aquillus, and Persona of De Montf., and Struthiolaria of Lam.; Ranella, including Buffo and Apollon of De Montf.; Murex, including Brontes, Chicoreus, Typhis, and Phos of the same.

Family 2. Entomostomata (Buccinum, Linn.). *Genera* * (Turriculated Entomostomes), Cerithium, including Vertagus of Schum.; Triphora or Tristoma of Deshayes; Nérinė of Defrance, Potamides of Brongniart, Pyrazus of De Montf., and Pirena of Lam.; Melanopsis; Planaxis; Subula. ** (Turbinaceous Entomostomes, or those whose spire is moderately elongated and rarely subturriculated), Terebra; Eburna; Buccinum, including Alectrion and Cyclops of De Montf., and Nassa of Lam. *** (Ampullaceous Entomostomes, or those whose shell is in general globulose), Harpa; Dolium, including Perdix of De Montf.; Cassidaria, including Oniscia of Sowerby; Cassis; Ricinula, including Sistrum of De Montf.; Cancellaria; Purpura, including Monoceros of De Montf. **** (Patteloïd Entomostomes, or those whose shell is in its totality very wide, very flat, with a spire but little marked, and no columella), Concholepas.

Family 3. Angyostomata. *Genera* * (an operculum), Strombus, including Pteroceras of Lam.; Conus, including Rhombbns, Cylinder, Rollus, and Hermes of De Montf. ** (no operculum), Terebellum, including Seraphs of De Montf.; Oliva; Ancillaria; Mitra,[†] including Turris of De Montf.; Imbricaria of Schum., and Conœlix of Swainson; Voluta, including Turbinellus of Oken and Cymbium of De Montf.; Marginella, including Volvaria of Lam.; Peribolus;[†] Cypræa; Ovula, including Calpurnus, Ultimus, and Radius of De Montf.

Order 2.

Asiphonobranchiata.

Family 1. Goniostomata (Trochus, Linn.). *Genera*, Solarium, including Maclurites of Lesueur and Euomphalus of Sowerby; Trochus, including Infundibulum, Phorus, Calcar, Tectus, Telescopium and Cantharidus of De Montf., and Rotella of Lam.

Family 2. Cricostomata (Turbo, Linn.). *Genera*, Turbo, including Clanculus and Meleagris of De Montf.; Labio of Oken, Monodonta of Lam., and Littorina of De Férussac; Pleurotomarium; Delphinula, including Trigonostoma; Turritella; Proto; Scalaria, including Aciona of Leach; Vermetus; Siliquaria; Magilus; Valvata; Cyclostoma, including Cyclophorus of De Montf.; and Paludina.

Family 3. Ellipsostomata. *Genera*, Melania; Rissoa, including Alvania of Risso; Phasianella; Ampullaria, including Lanistes of De Montf.; Helicina, including Ampullina and Olygira of Say; Pleurocerus, including Oxytrème of Rafinesque.

Family 4. Hemicyclostoma (Nerita, Linn.). *Genera*, Natica, including Polinices of De Montf.; Nerita. * (right lip dentated, Nerita, Lam.), Peloronta of Oken and Clithon of De Montf. ** (right lip not toothed), Neritina, Lam.; Velates, De Montf.; Pileolus, Sow.; Septaria.

Family 5. Oxystoma. *Genus*, Janthina.

Subclass II.

Paracephalophora Monoica.

§ 1.

Organs of respiration, and shell, where it exists, non-symmetrical.

Order 1.

Pulmobranchiata.

Family 1. Limnacea. *Genera*, Limnæa, including Radix of De Montf. and Omphiscola of Rafinesque; Physa; Planorbis.

Family 2. Auriculacea (Voluta, pars, Linn.). *Genera*, Pedipes, including Tornatella[‡] and Conovulus, Lam.; Auricula, including Scarabus of De Montf., Carychium of Müll., and Phytia of Gray; Pyramidella.[§]

Family 3. Limacinea (Helix, Linn., terrestrial). * (anterior border of the mantle elevated into a roll (bourrelet) and not a buckler; a shell). *Genera*, Succinea, including Amphibulimus, Lam.; Bulimus, including Bulimulus, Leach; Achatina, including Liguus and Polyphemus of De Montf.; Clausilia; Pupa, including Chondrus of Cuvier, Gibbus of De Montf., Vertigo of Müll., and Partula of De Féruss.; Tomogeres (Anostoma, Lam.); Helix * (circumference of the shell constantly carinated or subcarinated at all ages, Carocolla, Lam.), including Iberus, Caracolus, Acavus, and Zonites of De Montf., and Helicella of Lam. ** (anterior border of the mantle enlarged into a kind of buckler; shell null or nearly membranous), Helicolimax, including Helicarion of De Féruss.; Testacella; Parmacella; Limacella; Limax, including Arion of De Féruss.; Philomique and Eumèle of Rafin.; Onchidium, including Veronicella of De Blainv.

Order 2.

Chismobranchiata.

Coriocella; Sigaretus; Cryptostoma; Oxinöe; Stomatella;[‖] and Velutina.

Order 3.

Monopleurobranchiata.

Family 1. Subaplysiacea. *Genera*, Berthella; Pleurobranchus;[††] and Pleurobranchidium.

Family 2. Aplysiacea. *Genera*, Aplysia, including Acteon of Oken; Dolabella; Bursatella; Notarchus; and Elysia.

[†] Mr. Gray assured M. de Blainville that there was a small horny operculum in this genus.

[†] Probably only the young of Cypræa, notwithstanding Adanson's observation, that he had seen both young and old ones. He, no doubt, saw them in various stages of growth, during which the young of Cypræa put on very different aspects. His figures represent the young of a Cypræa.

[‡] M. de Blainville, in his last corrections, says that the true Tornatellæ should be separated from Pedipes, because the type of the latter genus is operculated, as Mr. Gray pointed out to him.

[§] Operculated, according to Mr. Gray.

[‖] Should be united, the orbicular species at least, with Cryptostoma, Quoy and Gaimard. De Blainville.

[††] M. de Blainville thinks that Westernia and Gervisi- [illegible] d Gaimard belong to this genus.

Family 3. Patelloïdea. *Genera*, Umbrella (Acardo of Megerle); Siphonaria; and Tylodina.

Family 4. Akera. *Genera*, Bulla, including Aplustre of Schum. and Atys and Scaphander of De Montf.; Bellerophus; Bullæa; Lobaria; Sormetus; Gasteroptera; and Atlas.

§ 2.

Order 1.

Aporobranchiata.

Family 1. Thecosomata. *Genera*, Hyalæa; Cleodora, including Vaginella of Daudin and Styliola of Lesueur; Cymbulia, including Argivora of Lesueur; and Pyrgo.

Family 2. Gymnosomata. *Genera*, Clio, including Cliodites, Quoy, and Gaim.; and Pneumoderma.

Family 3. Psilosomata. *Genus*, Phylliröe

Order 2.

Polybranchiata.

Family 1. Tetracerata. *Genera*, Glaucus; Laniogerus; Tergipes; Cavolina; Eolida; Dermatobranchus; and Placobranchus.

Family 2. Dicerata. *Genera*, Scyllæa; Tritonia; and Tethys.

Order 3.

Cyclobranchiata.

Genera, Doris, including Polycera of Cuv.; Onchidoris; and Peronia.

Order 4.

Inferobranchiata.

Genera, Phyllidia and Linguella.

Order 5.

Nucleobranchiata.

Family 1. Nectopoda. *Genera*, Pterotrachea, including Firola, Firolöides and Sagitella of Lesueur; and Carinaria.

Family 2. Pteropoda. *Genera*, Atlanta, Spiratella, and Argonauta.

Subclass III.

Paracephalophora Hermaphrodita (Patella, Linn.).

§ 1.

Organs of respiration and shell symmetrical.

Order 1.

Cirrhobranchiata.

Genus, Dentalium, including Entale of Defr.

Order 2.

Cervicobranchiata.

Family 1. Retifera. *Genus* Patella, including Helcion of De Montf.

Family 2. Branchifera. *Genera* Fissurella; Emarginula, including Rimula of Defrance; and Parmophorus.

§ 2.

Organs of respiration and shell non-symmetrical.

Order 3.

Scutibranchiata.

Family 1. Otidea. *Genera*, Haliotis, including Padollus of De Montf., and Stomatia of Lam.; and Ancylus.

Family 2. Calyptracea. *Genera*, Crepidula; Calyptræa; Capulus; Hipponyx; and Notrema.

Class III.

Acephalophora.

Order 1.

Palliobranchiata.

§ 1.

Shell symmetrical.

Genera, Lingula, Terebratula, including Pentamerus, Spirifer, and Productus, Sow., Strygocephalus, Defr., and Magas; Thecidea; Strophomena; Pachytes; Dianchora; and Podopsis.

§ 2.

Shell non-symmetrical, irregular, constantly adherent.

Genera, Orbicula, including Discina, Lam.; and Crania.

Order 2.

Rudista.

Genera, Spherulites; Hippurites; Radiolites; Birostrites; including Iodamia of Defr.; and Calceola.

Order 3.

Lamellibranchiata.

Family 1. Ostracea. *Genera*, Anomia; Placuna; Harpax; Ostrea; and Gryphæa.

Family 2. Subostracea (Ostrea, Linn.). *Genera*, Ostrea; Spondylus; Plicatula; Hinnites; Pecten, including Amusium and Pandora of Megerle, and Neithea of Drouet, Pedum; and Lima.

Family 3. Margaritacea. *Genera*, Vulsella; Malleus; Perna; Crenatula; Inoceramus; Catillus; Pulvinites; Gervillia; and Avicula, including Margaritiphora of Megerle, Margarita, Leach, Meleagrina, Lam.

Family 4. Mytilacea. *Genera*, Mytilus, including Modiola and Lithodomus (Lithophaga of Megerle); Pinna.

Family 5. Polyodonta, or Arcacea (Arca, Linn.). *Genera*, Arca, including Trisis of Oken, and Cucullæa of Lam.; Pectunculus; and Nucula.

Family 6. Submytilacea. * (species with an epidermis and nacreous; freshwater). *Genera*, Anodonta, including Berpolis, Leach, Iridina, Lam., Dipsas of Leach, Alasmisodonta of Say, and Cristaria of Schum.; Unio, including Hyria and Castalia of Lam. * * (species without an evident epidermis, not nacreous, and more or less pectinated; marine). Cardita, including Venericardia and Cypricardia of Lam.

Family 7. Chamacea. * (shell irregular). *Genera*, Chama, including Chamostrea of De Roissy; Diceras, Etheria.† * * (shell regular). Tridacna, including Hippopus; Isocardia; Trigonia, including Opis of Defr.

Family 8. Conchacea. § 1. Regular Conchacea with lateral distant teeth. *Genera*, Cardium, including Hemicardium; Donax, including Capsa, Lam.; Tellina, including Tellinides, Lam.; Lucina, including Loripes of *Poli*, Amphidesma of Lam., Fimbria of Megerle, Corbis of Cuv.; Cyclas, including Cornea, Corbicula, and Pisum of Megerle, Cyrena and Galathæa of Lam.; Cyprina; Mactra; and Erycina. § 2. Regular Conchacea without lateral distant teeth. Crassatella; Venus, including Arthemis of Poli, Venus, Cytheræa, and Crassina of Lam. (Astarte of Sowerby, Nicania, Leach), Triquetra of De Blainv., and Macoma of Leach. § 3. Irregular Conchacea; Venerupis, including Rupellaria of Fl. de Bell., and Petricola of Lam.; Coralliophaga; Clotho; and Ungulina.

Family 9. Pyloridea. § 1. Ligament internal. *Genera*, * Corbula; Sphæna; Osteodesma, including Rupicola of Fl. de Bell.; Thracia; Hemicyclostoma; and Anatina. * * Mya, including Erodona of Daudin; Lutricola, including Ligula of Leach, and Lutraria of Lam. § 2. Ligament external and convex. Psammocola, including Psammobia and Psammotea of Lam.; Soletellina; Sanguinolaria; Solecurtus; Solen; Solemya; Glycimera, including Myoconcha?; Panopæa; Saxicava; Byssomya; Rhomboides; Hiatella, including Biapholius of Leach; Gastrochæna; Clavagella; and Aspergillum.

Family 10. Adesmacea. *Genera*, Pholas, including Martesia of Leach; Teredina; Teredo; Fistulana; and Septaria.

Order 4.

Heterobranchiata.

Family 1. Ascidiacea (Ascidia, Linn.). Tribe 1. Simple Ascidians. *Genera*, Ascidia; Bipapillaria; Fodia. Tribe 2. Aggregated Ascidians, Pyura; Distoma, including Sigellina of Savign.; Botryllus, including Diazoma and Polyclina of Savign., and Polycyclus and Botryllus of Lam.; Synoicum, including Enocœlium, Didermum, and Aplidium of Savign., and Pulmonella of Lam.

Family 2. Salpacea. Tribe 1. Simple Salpians. *Genera*, Salpa, including the genera Monophore and Timorienne of Quoy and Gaimard. Tribe 2. Aggregated Salpians, Pyrosoma.

Sub-type.

MALENTOZOARIA.

Class I.

Nematopoda.

Family 1. Lepadicea. *Genera*, Lepas; Gymnolepas, including Otion and Cineras of Leach; Pentalepas, including Pentalasmis and Pollicipes of Leach; Polylepas, including Scalpellum of Leach; and Litholepas.

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† M de Blainville, in his corrections, allows that Etheria will come better under the Submytilacea, according to the opinion of Mr. Sowerby.

Family 2. Balanidea. (Balanus, Brug.). * (operculum articulated, and more or less vertical). *Genera*, Balanus, including Acasta of Leach; Ochthosia; Conia, including Asemus of Ranzani; Creusia, including Pyrgoma of Savign.; and Chthalamus. * * (operculum not articulated, and more or less horizontal). Coronula, including Chelonobia of Leach, Cetopira and Diadema of Ranzani, and Tubicinella of Lam.

Class II.

POLYPLAXIPHORA. (Chiton, Linn.)

Genera, Chiton, including Chitonellus of Lam., and Chitonellus of De Blainv.

Our limits will not allow us to do more than refer to the systems of Schumacher, Latreille, and Rang, though they will, the latter especially, which is in many respects a happy combination of the systems of Cuvier, Lamarck, and De Blainville, with some alterations, well repay the student for their perusal.

The organization of the animals above treated of will be found under the titles CEPHALOPODA, CONCHIFERA, GASTEROPODA, and other articles relating to them in this work.

MALACONO'TUS. [SHRIKES.]

MALACOPTERY'GII, according to Cuvier, the second great division, or order, of osseous Fishes, the species of which are distinguished by all the rays of the fins being soft and cartilaginous; exhibiting minute articulations and often divided into small fibres at their extremities. It frequently happens however that the anterior ray of the dorsal or of the pectoral fins is hard and bony, a character observable in nearly all the species of the Siluridæ and in many belonging to other families.

The greater portion of the fishes of this order have the scales formed of simple laminæ and with smooth margins; in this respect differing from the species of the *Percidæ*, *Sciænidæ*, &c., in which the edges of the scales are pectinated or serrated. The *Pleuronectidæ*, or Flat-fishes, however, present the latter structure of scale; and yet, according to Cuvier, are placed in the Malacopterygii. M. Agassiz on this account removes this group to another section, and he also arranges the *Siluridæ* in another group, owing to the structure of their scales. [SILURIDÆ.]

The *Malacopterygii* are divided into three sections. First, the *Abdominales*, in which the ventral fins are situated in the abdomen, far behind the pectorals. In the second section (*Subbrachiales*) the ventral fins are situated immediately beneath the pectorals, and the pelvis is suspended to the bones of the shoulder. In the third section (*Apodes*) the ventrals are wanting.

The section *Abdominales* contains the following families. 1. *Cyprinidæ*, or fishes allied to the Carp; such as Barbel, Gudgeon, Tench, Bream, Roach, &c. 2. *Esocidæ*, of which the common Pike may be regarded as the type. 3. *Siluridæ*, a family of which there are no representatives in this country, at least not well authenticated. 4. *Salmonidæ*, or fishes of the Salmon tribe. 5. *Clupeidæ*, of which we have familiar examples in the Herring, Sprat, White-bait, Pilchard, Shad, &c.

The section *Subbrachiales* contains the families *Gadidæ* (Cod-fish, Haddock, Whiting, Ling, &c.); the *Pleuronectidæ*, or Flat-fishes, such as the Flounder, Halibut, Sole, &c.; the *Discoboli*, of which family the common Lump-fish will furnish an example; and finally the *Echeneididæ*, containing the species of Remora.

The third section, *Apodes*, contains the Eels, Lance-fishes, &c.

MALACORHYNCHUS. [DUCKS, vol. ix., p. 179.]

MALACO'STRACA (Μαλακόστρακα), a term employed by Aristotle to designate the *Crustacea* generally, but confined by Dr. Leach in his arrangement to the second order of the class.

The *Malacostraca* of Leach are divided into three tribes.

1. *Brachyuri*, including the families Canceridæ and Oxyrhynchidæ.

2. *Macrouri*, including the families Paguridæ, Palinuridæ, Astacidæ, and Squillidæ.

3. *Gasteruri*, including the families Gnathidæ, Gammaridæ, Corophiidæ, Caprellidæ, and Apseudiidæ.

MALACO'TA, Schumacher's name for a genus of Cirripeds, *Otion* of Leach.

MALACOZO'A, or MALACOZO'ARIA. [MALACOLOGY, p. 322.]

MA'LAGA (the Μάλακα of Strabo, 156, *Casaub.*), the principal seaport of the province of Granada in Spain, is situated in 36° 45′ N. lat. and 4° 30′ W. long., in the bight of a bay on the coast of the Mediterranean. Inland from the city extends a spacious and fertile plain, called La Hoya, bounded by ranges of lofty mountains. The Guadalmedina, a mere brook in summer, but in winter a stream of considerable volume, enters the sea immediately to the west of the city.

Malaga is of great antiquity, and claims to have been founded eight or nine centuries B.C. by the Phœnicians, who gave it the name of 'Malcha,' or 'royal,' to intimate the estimation in which they held it. But of this high antiquity there is no evidence. W. Humboldt (*Prüfung der Untersuchungen über die Urbewohner Hispaniens*, &c. says that Malaca is a pure Basque word, and signifies the 'side of a mountain.' It was possessed successively by the Carthaginians; by the Romans, who called it 'Malaca,' and made it a municipium and confederate city; by the Goths, and by the Arabs. For the first three centuries of the Moslem domination in Spain, Malaga was subject to the caliphs of Cordoba; but on the disruption of that caliphat it fell into the hands of one petty sovereign after another, till it was annexed, early in the thirteenth century, to the kingdom of Granada. In 1487 Ferdinand and Isabella wrested it from the Moors, after an obstinate siege of three months, during which the citizens endured the severest horrors of famine.

From the earliest ages, under all the nations who have possessed it, Malaga has been renowned for its commerce. At the present day it is the only flourishing city in the province of Andalusia. Its imports are broad-cloths, cottons, laces, spices, hardware, and cutlery. Its exports are much more considerable, and amount on the yearly average to more than 4,000,000 dollars, or about 1,000,000*l.* sterling. They consist principally of wine and fruits; the former, which was once well known in England as 'mountain,' is now almost wholly consumed by the United States and Spanish America; the latter are chiefly fresh grapes and raisins, vast quantities of which reach the English market, together with some figs, almonds, oranges, and lemons. The other exports are brandy, oil, saffron, vermicelli, barilla, and soap, which is the only manufacture of Malaga worthy of mention.

Malaga at present contains about 62,000 inhabitants, but it was much more populous in the time of the Moors. Though the streets are narrow, tortuous, wretchedly paved, and not very clean, the city has a gay and cheerful aspect, as the exteriors of the houses are whitewashed or stained a yellow-ochre colour. Many of the roofs are flat, as in the East, and are surmounted by miradores, or square towers with open galleries, where the citizens enjoy the cool sea-breezes. The city is divided into six parishes, and has several colleges and public hospitals, an iron-foundry of very recent erection, and a tobacco-factory where 700 persons are daily employed in making cigars. There were also twenty-four convents, but these were suppressed in 1835. Malaga is an episcopal see, and possesses a cathedral, a light and handsome building in the Greco-Gothic style; it is nearly 400 feet long, 180 broad, 125 in height from the pavement to the roof, and is surmounted by a steeple 270 feet high. It contains few pictures of merit, but has some good specimens of the coloured wooden statuary in which the Spaniards excel. The alameda, or public promenade, is adorned with fountains and flowering shrubs, and flanked by private mansions of great splendour. The harbour of Malaga is spacious enough to accommodate a large fleet; it is protected on the east by a massy stone mole, five furlongs in length, terminated by a handsome lighthouse. Few remains of Roman architecture now exist in Malaga; those of Moorish buildings are numerous, and are interspersed through the city in gateways, towers, walls, houses, and fragments of mosques. But the grand boast of Malaga is the Moorish castle, built in 1279, and covering the slope of a hill immediately to the east of the city. It is of great extent, and is divided into the lower castle, or alcazaba, and the upper, or gibralfaro, so called by the Moors from a Roman pharos which is said to have stood on the crest of the hill. The whole displays in its ruinous condition the effects of the Christian artillery in the siege of 1487.

Malaga enjoys a serene and delightful climate, with a peculiarly dry and unclouded atmosphere. Provisions a abundant and cheap. The citizens are gay, courteous, and hospitable; and the females are renowned throughout Spain for their grace and beauty, sprightliness and humour. The lower orders of Malagueños are indolent, thievish, revengeful, and prone to commit assassination. Malaga gave birth in the twelfth century to Ibn Beithar, the naturalist, the Pliny of the Arabians.

(Ponz, *Viage de España;* Cruz, *Viage de España;* Laborde, *Itinéraire Descriptif de l'Espagne;* Carter's *Journey from Gibraltar to Malaga;* Townsend's *Spain;* Conde's *Aledris* and *Historia de los Arabes en España.* This account of Malaga is principally from personal observation.)

MALAGRIDA. [JESUITS.]

MA'LALA, JOHN (called also Malela, or Malalas, or Malelas), was the author of a chronicle in the Greek language, in 18 books, which extends from the creation of the world to the reign of Justinian. The time in which he lived is uncertain. He must have been alive after the reign of Justinian, since he mentions the number of years which that emperor reigned. Hody, in his Prolegomena to the Oxford edition of this writer, endeavours to show that he lived in the ninth century; but this opinion has been controverted by Jortin, Gibbon, Reiske, and L. Dindorf, who maintain that he lived shortly after the reign of Justinian.

Malala is a Syriac word, signifying 'orator,' or 'rhetorician.' He is also called John of Antioch; but he must not be confounded with the John of Antioch who also wrote a chronicle, extracts from which have been preserved in a work of Constantine Porphyrogennetus, 'On Virtues and Vices.'

The chronicle of Malala was printed for the first time at Oxford, 1691, under the superintendence of Chilmead, who died however before the work was published. Hody prefixed a dissertation to that edition on the life and writings of Malala; and Bentley an appendix, in the form of a letter to Mill, in which he corrected numerous passages. Bentley's letter to Mill was reprinted at the end of Bentley's 'Emendationes in Menandri et Philemonis Reliquias,' Camb., 1713. The chronicle was also published at Venice in 1733; but the best edition is by L. Dindorf (Bonn, 1831), which contains the notes of Chilmead and Hody, as well as Bentley's letter to Mill.

(Hody's *Prolegomena;* Dindorf's *Preface.*)

MÄLARN, LAKE OF. [SWEDEN.]

MALATIA (or more correctly Malatiyah), a town of Asia Minor, about 38° 25′ N. lat. and 38° 20′ E. long., is built in a fine plain, about 15 miles from the banks of the Euphrates. About six miles south-west of it is the town of Aspúzi, to which the inhabitants of Malatiyah retire for the seven summer months, returning for the five winter months to Malatiyah. These towns, which may be considered as one, contained in 1836, 3923 families, 2800 of which were Turkish and 1123 Armenian. The town was formerly more populous, but plague, cholera, and the depredations of the Kurds have greatly reduced it. Aspúzi is situated on the side of a mountain in a forest of fruit-trees. Malatiyah is in a plain, which at present is nearly reduced to an uncultivated state. The antient walls are in ruins, and in most parts have fallen down; the houses have a mean appearance, and the shops in the bazar are mere mud-stalls. There are two well built mosques and two caravanserais, all in the Persian style of architecture. Malatiyah derives its present importance only from its being situated on the great caravan-road which leads from Sivas to Diar-bekr and Mozul, and from being one of the places to which the Kurds resort for the purpose of trade. (Brant, in the *London Geographical Journal,* vol. vi.)

MALAY PENINSULA constitutes the most southern extremity of the continent of Asia, extending between the Gulf of Bengal and the Straits of Malacca on the west, and the Gulf of Siam and the Chinese Sea on the east. It is united to the continent at its northern extremity. Its most southern points form the northern shores of the Straits of Singapore. Kwi Point, in the Gulf of Siam, and the mouth of the Tanasserim river, which enters the Gulf of Bengal, may be considered as constituting its northern boundary; they are situated near 12° N. lat. Cape Burus, the most southern promontory of Asia, in 1° 15′ N. lat., and Cape Romania, in 1° 17′, constitute the two extremities of the Straits of Singapore. The peninsula lies between 98° and 104° E. long. It is 750 miles long, with a width varying between 60 and 180 miles. Its surface may cover an area of about 80,000 square miles, or about 4000 square miles less than that of Great Britain.

The peninsula is traversed by a mountain-range, which is a continuation of the Samroiyet (*i.e.* three hundred peaks) mountains, which between 12° and 14° N. lat. separate the valley of the Tanasserim river from the streams which fall into the Gulf of Siam. This chain, which in this part rises in numerous peaks to the elevation of 3000 feet, sinks lower south of Kwi Point, where it traverses the isthmus of Krah, the narrowest part of the peninsula, between 8° and 12° N. lat. It appears that the mountain-range on this long isthmus, though of moderate elevation, occupies together with its offsets the whole country from one sea to the other, except at its southern extremity, where an extensive tract of alluvial land, enclosing the bay of Chai-ya, occurs on the shores of the Gulf of Siam.

The isthmus of Krah lies due north and south. At its southern extremity, between 8° and 9° N. lat., the Malay Peninsula turns to the south-east, and preserves this direction to its most southern point. Between 6° 30′ and 8° N. lat. the mountains seem to be higher than on the isthmus, but this fact is not established, as no European has ever traversed this country. The tract between 5° and 6° 30′ N. lat. appears to be the highest part of the mountain-range, the peak of Titch Bangsa, opposite the town of Queda, rising, according to Crawfurd, to 6000 feet. The mountains in this part occupy the greatest part of the country, leaving only a low level tract, about seven or eight miles in width, along the Gulf of Bengal, which is swampy and mostly covered with jungle, but when cultivated yields rich crops of rice. On the eastern coast the level tracts are probably more extensive, but the offsets of the mountains in some parts approach near the sea-shore, as Cape Patani and Rocky Point.

South of 5° N. lat. is the widest part of the peninsula, which is about 180 miles in breadth. The interior or mountain-region of this part is little known, but it is certain that it is less elevated than the country farther north, and the summits of the hills are more rounded. The level tract along the Straits of Malacca widens considerably, being about 18 miles in breadth north of 4° lat., and more than 20 miles in breadth south of that parallel; but along the sea-shore a few isolated hills rise to a moderate height, as Rachado Point and others. The range forming the water-shed between the rivers which fall into the Straits of Malacca and the Chinese Sea does not occupy the centre of the peninsula, but is nearer the western than the eastern shores. The level country along the Chinese Sea is also, so far as is known, much more extensive south of the town of Pahang, and contains a lake, that of Braugh, 50 miles in circumference. On the eastern boundary of the district of Malacca is an elevated summit, the Gunong Leadang of the natives, and Mount Ophir of the Portuguese, whose summit is estimated to be 4000 feet high. It is 24 miles from the Straits. Proceeding farther south, the mountains subside into hills; but even along the Old Straits, which divide the island of Singapore from the continent, the country presents a rocky and elevated shore, and its surface is strongly undulating, though it can hardly be called hilly. Towards this extremity the level country along the Straits of Malacca and the Chinese Sea is of inconsiderable width.

The comparatively small width of this peninsula and the disposition of the mountain-range prevent the formation of considerable rivers. The largest which are known are the Muar river, which forms the southern boundary of the district of Malacca and falls into the strait of that name, and the Pahang river, which runs nearly north on the eastern side of the peninsula. Both rivers are navigable before they issue from the mountains, and are separated by a portage of not more than 300 yards. The Pahang river flows 200 miles under the name of Suruting, and falls into the lake of Braugh, from which it issues under the name of the Braugh river, but soon takes that of Pahang river. At its mouth, near Pahang, are four large islands, planted with cocoa-nut and palm trees. It is probable that there are other rivers, navigable at least for a considerable extent, but they are not known. The number of small rivers is very great, and there probably is no country better watered than this peninsula.

The climate differs on the eastern and western sides of the peninsula. The eastern resembles the coast of Coromandel and of Cochin China Proper, as the mountain-range interrupts the clouds brought by the south-west monsoon, during which period the dry season prevails. But the country is exposed to the full effects of the north-east monsoon, and the wet season commences in the beginning of November and continues till March. The northern part of the western coast is exposed to the south-west monsoon, and in climate resembles Aracan, having its rainy season in our summer, and its dry season in our winter. The southern portion of the western coast differs in climate from all other countries in Southern Asia. It constitutes the eastern side of a large valley, running from north-west to south-east, in the centre of which the Straits of Malacca extend like a large river. On the north-east this valley is sheltered by the mountain-range which traverses the peninsula in its whole length, and on the south-west by that mountain-chain which extends along the south-western shores of the island of Sumatra. Thus this country, as well as the low eastern coast of Sumatra, is perfectly sheltered against both monsoons, the north-eastern and the south-western. In this country accordingly the regular succession of dry and wet seasons is unknown. Showers of rain fall in every month of the year, but more abundantly in our summer. They moderate the heat of the atmosphere, and maintain a vigorous vegetation. No gales are known to occur, and no winds except the sea and land breezes. The heat is not so insupportable as in other countries near the equator; and though during the day the sandy shores are heated to a great degree, the air is cooled sufficiently during the night. Though no meteorological observations on this country have been published, it is known that the range of the thermometer is comparatively very small; it seems to amount hardly to 10 or 12 degrees in the whole year.

The soil seems not to be distinguished by fertility, being in most places composed of a tough red clay, or of a black earth similar to peat; but in many places it yields rich crops of rice. Besides rice the inhabitants live on plantains and some other vegetables; also on fruits, in which this country, especially towards the south, surpasses all other countries. The cultivated fruits are chiefly pine-apples, mangosteens, durion, shaddocks, and oranges. As articles of commerce, pepper, cotton, and a little coffee are cultivated. The country is generally covered with high trees, even on part of the mountains, but the teak-tree does not occur. The variety of trees and plants is very great, but they have not been examined by botanists, except in a few places. Rattans are exported in great numbers.

Cattle are few in number, but buffaloes abound. No sheep are kept; hogs and fowls are plentiful. In the uncultivated tracts and woods tigers, leopards, and rhinoceroses are frequently met with, and sometimes elephants. Among the birds, that kind of swallow which makes the edible nests is the most remarkable. It occurs however chiefly on the islands which skirt the peninsula on the west, and perhaps also in some places on the western coast, where the rocks approach the sea-shore. Fish is extremely plentiful, and constitutes one of the most common articles of food.

The most important articles of commerce are from the mineral kingdom. Gold is found in all the rivers, and also got from mines. A sufficient quantity of this metal is collected to justify the name of Chersonesus Aurea, or the Golden Chersonese, which the antients gave to this country. Tin is still more abundant, and seems to occur in the whole range from the isthmus of Krah to the southern extremity, but not in the Samroiyet range, north of the isthmus. The quantity annually collected probably exceeds 40,000 peculs (1 pecul = 133⅓ pounds), and the greatest part goes to Pulo Penang, Malacca, and Singapore: part is exported from the harbours on the Gulf of Siam to China. Other metals are not noticed.

The bulk of the population consists of Siamese and of Malays. The former occupy the isthmus of Krah and the districts north of 6° 40′ N. lat., and the latter the remainder of the peninsula. The Malays of this country have not attained that degree of civilisation which is found among the inhabitants of Sumatra and Java. They show little industry in cultivating the ground, and still less in the mechanical arts. Their principal occupation is fishing. [MALAYS.] The language of these nations is different. In the interior there are two other nations: the Jakong, or Benua, inhabit some wooded plains towards the southern extremity of the peninsula; they are of a copper-colour, their hair is straight, and their features resemble those of the Malays. They have no fixed habitations, and live by the produce of the chace. Crawfurd thinks that they are Malays in the lowest state of civilisation, an opinion which is supported by their language, which contains but few words that cannot be traced in the Malay language. In the interior, between 6° and 8°, live the Samangs, who seem to belong to the race commonly called the Australian negroes, which is found from the Adaman Islands on the west, to Papua, or New Guinea, on the east, as well as on the continent of Australia. They resemble the African negroes in their features, and have woolly hair. In stature however they are much shorter, their average height, according to Light, in Marsden's 'History of Sumatra,' not exceeding 4 feet 8 inches. They have no fixed habitations, they live in the forests and mountains on the produce of the chase, and eat every kind of animal food, even reptiles. They are extremely timid, and have little intercourse with their neighbours. The whole of the Malay peninsula is thinly inhabited, and many extensive districts in the interior are unpeopled. The whole population perhaps does not exceed one million.

The northern part of the peninsula, as far south as the bay of Chai-ya, is immediately subject to the king of Siam. On that bay are two harbours, called Chai-ya and Bandon, and on the opposite western coast the harbour of Phunga, or Pongo, from which a commercial road traverses the peninsula to Chai-ya and Bandon. The produce of the island of Junk Seylon, or Salanga, and also European goods, are transported from Phunga across the isthmus to Bandon and Chai-ya, and thence shipped to Bangkok. From the island of Kos Sammi, or Pulo Carnam, the Chinese fetch cotton and edible nests; ten or fifteen junks arrive annually for that purpose.

That portion of the peninsula which lies between the bay of Chai-ya and Cajoe Patani is partly governed by Malay sovereigns, dependent on the king of Siam, and partly belongs immediately to Siam. The town of Ligar is said to have 5000 inhabitants, Malays, Chinese, and Siamese. A few Chinese junks arrive annually here for cotton, tin, pepper, and rattans. The same articles, and in addition to them sapan-wood, are exported from the towns of Talung and Sungara, which lie opposite the mountainous island of Tantalem. A road begins at Talung which crosses the peninsula to the small town of Trang, and is passable for elephants. Patani is the most southern of the small kingdoms subject to Siam. It is more fertile and productive than the other Malay states. Its capital was once much visited by vessels from Hindustan in their voyages to Siam, Cochinchina, and China, but at present it is rarely resorted to. It has some intercourse with Singapore; it exports much rice and salt, and a little tin.

The kingdoms of Calantan and Tringano on the eastern, and that of Queda on the western side of the peninsula are only nominally dependent on Siam, and their commercial produce, consisting of gold, tin, and pepper, is brought to Singapore. Tringano, situated at the mouth of the little river Tringano, seems to be a considerable place. From Queda a commercial road, passable for elephants, leads across the peninsula to Sungora; this road is much frequented. Another communication connects the mouth of the river Muda in Queda with the town of Patani. For a considerable distance the goods are conveyed in boats on the river, but still this road is not much frequented. The British colony of Pulo Penang, or Prince of Wales Island, is partly situated within the kingdom of Queda. [PENANG.] The town of Queda is a small place. Its commerce was formerly considerable, but has been nearly destroyed by the establishment on Prince of Wales Island. A few miles farther up is Alustar, a more populous place, and the favorite residence of the princes.

The southern extremity of the peninsula is divided between the kingdoms of Pahang and Johore on the eastern side, that of Rumbowe in the interior, and those of Salangore and Perak on the western coast, together with the British colony of Malacca. [MALACCA.] These kingdoms are independent, and under the protection of the British. None of the commercial places in these states are of importance; they send their produce, consisting of gold, tin, and pepper, to Malacca and Singapore. Perak contains the most productive tin mines in the peninsula, and in Salangore also some rich tin mines have been opened, not far from Cape Rachado. The islands lying in the Chinese Sea, as far as the Nantnas, are subject to Johore. Between the towns of Malacca and Pahang there is a communication, which is much favoured by the water-carriage on the river Suruting, a branch of the Pahang river, and also on the Pahang.

(Marsden's *History of Sumatra;* Crawfurd's *Embassy to Siam and Cochin China;* Finlayson's *Journal of a Missio* *to Siam and Hué;* and *Notices of the Indian Archipelago*, &c., collected by J. H. Moor, Singapore, 1837.)

MALAYS, THE, are a nation of Southern Asia, who occupy the shores of the Malay Peninsula, and, if language may be taken as a proof of the fact, seem to have spread over all the islands from Madagascar on the west to Easter Island on the east. Almost all the languages spoken in the islands of the Indian Archipelago and in the Pacific contain a great number of words and expressions which evidently are derived from the Malay language, and the physical character of the people confirms the inference drawn from this circumstance. The great body of this nation however inhabit the larger islands of the Indian Archipelago.

In person the Malays are short, squat, and robust. The medium height of the men may be five feet two inches, and that of the women four feet eleven inches, or about four inches less than the average stature of Europeans. Their lower limbs are rather large and heavy, but not ill-formed. Their arms are rather fleshy than muscular. The face is of a round form, the mouth is wide, and the teeth remarkably fine. The chin is rather of a square form; the angles of the lower jaw are very prominent. The cheekbones are high, and the cheek consequently rather hollow. The nose is short and small, never prominent, but never flat. The eyes are small, and always black. The complexion is generally brown, but varies a little in the different tribes: climate seems to have nothing to do with the colour. The fairest races are generally to the west, but some of them are on the equator. The hair is long, lank, harsh, and always black. Compared with Europeans and the nations of western Asia, the Malays must be considered an ill-looking people. In person and complexion they most resemble the inhabitants of Siam and Ava, but they differ considerably even from them, and are a very distinct people, with a striking likeness among themselves, and a marked dissimilarity from all other people.

Crawfurd, who has carefully examined the different languages of the Indian Archipelago, finds in them a great similarity in respect of pronunciation, grammatical structure, and idiom. Twenty consonants and five vowels are the greatest number which these languages generally admit, and only two diphthong sounds occur. The structure of these languages is very simple: the relations of nouns are marked by prepositions, the tenses of verbs by auxiliaries, the passive forms by the prefixing of particles, and the transitive forms by affixing particles. Many idiomatic phrases, though expressed by words differing in sound among different tribes, agree in the signification of the single words. These languages are rich in expressions for familiar objects, but poor in the expression of abstract ideas, particularly such as relate to the operations of the mind. For many moral ideas they have no expressions at all. Not less than five kinds of written character are known among the nations who inhabit the Indian Archipelago, the Arabic characters not included, which are in general use among the nations that speak the Malay language.

The Malays have made considerable progress in civilization; but more in the island of Java than on the other islands of the Indian Archipelago. They are well acquainted with agriculture and some of the mechanical arts. They have also made some progress in medicine and music. They are undoubtedly more civilized than any of the nations of southern Asia which inhabit the countries between China and Hindustan. The Malays have great mental activity, and eagerly apply themselves to commerce and navigation, but their navigation does not extend beyond the seas surrounding the Indian Archipelago. Being expert navigators in these seas, and being favoured by the great number of small inhabited islands, their daring spirit urges them to piracy. Various parts of the Indian Sea are thus made very dangerous for small vessels, but the Malay pirates rarely attack European ships. Most of the Malay tribes that inhabit the Indian Archipelago are Mohammedans, but they differ considerably from the Arabs in manners; their wives, for instance, are not secluded from society. They are very revengeful, and among the different ways of taking revenge is the extraordinary one of 'running a muck,' as it is called.

According to the traditional history of many of the Malay tribes, the country of Menangkabao, in the interior of Sumatra, is their original seat, and it is asserted that they first issued from it so late as 1160, and passed to the Malay Peninsula, where they built a town, called Singapura. Hence they are said to have spread over the lower parts of all the islands of the Archipelago. But when we consider how far the Malay tribes are scattered towards the east in the islands of the Pacific, this tradition seems very improbable. It may however refer to the introduction of the Mohammedan creed, as, according to Marsden, a Mohammedan is called in Sumatra a Malay, even when he belongs to one of the tribes which are not of Malay origin. In the larger islands the Malay population generally occupies only the lower tracts along the coast, and the original inhabitants have retired before them into the interior. On the smaller islands the original inhabitants have been extirpated by them.

(Marsden's *History of Sumatra;* and Crawfurd's *History of the Indian Archipelago.*)

MALCOLM I., king of Scots, was the son of King Donald IV., who died in the year 904. He succeeded to the throne when King Constantine III. abdicated, for the retirement of a monastery, in the year 944; and he appears to have reigned about ten years. The principal event of his reign was the cession of Cumbria by the English king to the king of Scots. In this it is said the English king resigned to Scotland what he found he could not easily retain, the border districts being, from the mixed character of the population, in a state of very frequent disturbance; and by the cession of these districts the English king hoped to secure the fealty and friendship of the king of Scots. Malcolm was slain by the men of Moray, in the north of Scotland, where he had marched to repress an insurrection in that quarter; but the precise time, place, or circumstance in which this event occurred, is not certain. He had two grandsons of the same name with himself; the one by his son King Duffus, the other by his other son King Kenneth III. The former was slain by his ambitious uncle Kenneth, and never mounted the throne.

MALCOLM II., king of Scots, was the son of King Kenneth III., and inheriting the ambitious spirit of his father, he set up a claim to the throne, in opposition to his cousin King Kenneth IV., and on the fall of the latter in a pitched battle between the partisans of the two princes, Malcolm succeeded in the year 1003. He reigned about thirty years, the greater part of which period was spent in warlike encounters with the Danes, who sought a settlement in the kingdom. It was in gratitude for a victory obtained over these pirates, that Malcolm founded and endowed a religious house at Mortlach, which afterwards became a bishopric, and at a still later period went to form, with other churches, the bishopric of Aberdeen; and on the same occasion he made many and various grants and oblations to the church and clergy. His piety was accordingly acknowledged and approved by the papal see. Malcolm is also said to have been a legislator, and there is a collection of laws which go by his name, but the authenticity of the *Leges Malcolmi* is disputed. Malcolm died in the year 1033; and there is still shown in the church-yard of Glammis, 'King Malcolm's grave-stone,' which is a rude mass, without any inscription, 16 feet high and 5 feet broad. He appears to have had no son, but only two daughters, both of whom were married. One of these was mother of King Duncan, who was killed near Elgin in 1039, by a stroke of 'treasonous malice.'

MALCOLM III., king of Scots, was the son of 'the gracious Duncan,' whose story has been immortalized in the pages of Shakspeare. On his father's death Malcolm fled into England; but after the fall of Macbeth, and that of his successor, he recovered his father's sceptre, and was declared king in the year 1057; and, as Chalmers reckons, in the thirty-third year of his own age. He is commonly known in history as *Malcolm Canmore*, or *Malcolm Greathead*, probably from the wisdom and prudence of his character. A contemporary bard gives him two epithets, the one implying that he had a handsome person, the other that he had a cheerful mind; and it appears that for a series of years his reign was undisturbed either by foreign or domestic enemies. The accession of William Rufus however proved the signal for hostilities between the two countries; and in an encounter with the English forces Malcolm was surprised by Earl Mowbray, and slain on the 30th of November, 1093, in about the seventieth year of his age.

MALCOLM IV., king of Scots, was the grandson of King David I., and on the death of that king, on the 24th of May, 1153, he succeeded to the throne, being then in the twelfth year of his age. The same year he was called on to repress the insurrection of Somerled, Lord of the Isles, a

Hebridean chief of such great influence, that when a peace with him was secured, the event was deemed of sufficient importance to form an epoch in the dating of Scottish charters. The standard of rebellion was afterwards raised in Galloway, and Malcolm was obliged to lead a great force against Fergus, the lord of that country, whom he at length subdued. Malcolm had also a struggle with the men of Moray, who affected independence; and in 1161 he compelled them to submit to his authority. The powerful Somerled also again rose, and prepared to make another attempt on the dominions of the Scottish king; but the latter by his vigour triumphed over all his adversaries. The period of his reign however was not of long duration; as he died of a lingering disease at Jedburgh, on the 9th of December, 1165, at the early age of twenty-four.

MALCOLM, SIR JOHN, G.C.B. and K.L.S., was born at Eskdale, in the county of Dumfries, in Scotland, in 1769. He was sent to India, when he was only thirteen, under the care of his maternal uncle Dr. Paisley, and was appointed a cadet on the Madras establishment. He returned to England in 1794, for the benefit of his health, but sailed again to India in the following year, and took an active part, as an inferior officer, in the war with the celebrated Tippoo. After the fall of Seringapatam he was appointed, jointly with Captain (afterwards Sir T.) Monro, secretary to the commissioners who were entrusted with the division of Mysore; and his prudence and abilities were already so highly estimated by the British government in India, that he was sent in the same year (1799) to Persia on affairs of the most important nature.

On his return from Persia, in 1801, he was appointed private secretary to the governor-general; but he was again sent to Persia in the following year, in consequence of the death of Hajed Kulleel Khan, the Persian ambassador, who was accidentally shot at Bombay. In February, 1803, he was nominated to the presidency of Mysore, and joined the army of General Wellesley in his campaign against the Mahrattas; but in 1805 he was recalled to Bengal, where he was occupied in the performance of the most active and responsible political duties, and particularly in concluding treaties of alliance with several of the Indian princes.

In consequence of the extensive projects of Bonaparte, who was said to be meditating an invasion of India, and who had entered into an alliance with Persia, Malcolm was again sent to Persia in 1807, but was unable to obtain any advantages in favour of the British government. On his return to India, in 1808, he proceeded to his government in Mysore; but owing to a change in the policy of the Persian court, he was again appointed minister plenipotentiary to Persia, where he arrived in 1809, and was received in the most flattering and distinguished manner. On his departure in 1810, in consequence of the nomination of Sir Gore Ouseley as his majesty's ambassador at the Persian court, the shah conferred upon him the order of the Sun and Lion, and appointed him a khan and sepahdar of the empire. Malcolm returned to England in 1812, and was knighted shortly after his arrival. In 1815 he published his 'History of Persia,' in 2 vols. 4to., which contained an account of the country from the earliest period to the time when the work was published. This work is extracted from native sources, and is the only account which we possess in the European languages of many portions of Persian history. D'Herbelot's narrative terminated with the reign of Shahrokh, in A.D. 1446. Malcolm's History is also valuable for the information it affords us respecting the religion, government, manners, and customs of the inhabitants of Persia in all periods of their history; and more particularly for his accurate account of the state of Persia in his own time, which he had obtained by personal observation and diligent inquiries in the country.

Malcolm returned to India in 1817, and was, immediately on his arrival, attached, as the governor-general's political agent, with the rank of brigadier-general, to the army under Sir T. Hislop, in the Deccan. He served under this general, as second in command, in his campaigns against the Mahrattas and Pindarries, and greatly distinguished himself in the decisive battle of Mehidpoor, in which Holkar was completely routed. Mr. Canning, then president of the Board of Control, after moving the thanks of parliament to Sir T. Hislop, added, 'and to Sir J. Malcolm, who was second in command on that occasion, but who is second to no one in valour and renown. The name of that gallant officer will be remembered in India as long as the British flag is hoisted in that country.'

After the conclusion of this war Sir J. Malcolm received the military and political command of Malwa and the adjoining provinces, where he remained four years. The central provinces of India were at that time almost in a state of anarchy; the plundering expeditions of the Mahrattas and Pindarries had reduced many fertile districts to complete deserts, and had thereby forced multitudes to adopt the same marauding mode of life; and the war, which had just been brought to a close, had thrown upon society thousands of soldiers who had been trained to every species of bloodshed and rapine. Too much praise cannot be attributed to the prudent and firm manner in which Sir J. Malcolm administered the government of these provinces: he was particularly successful in conciliating the affections of the natives, and reclaiming by mild and conciliatory means the remains of the Mahratta and Pindarry armies from their savage mode of life. When Bishop Heber visited this part of India, a few years afterwards, the inhabitants spoke of Sir J. Malcolm in the highest terms of admiration, and eagerly asked when they might expect his return. An interesting account of this part of India was published by Sir J. Malcolm in 1823, under the title of 'A Memoir of Central India, including Malwa and the adjoining Provinces; with the History and copious Illustrations of the past and present Condition of that Country.'

Sir J. Malcolm returned to England in 1821; and on his quitting Madras a general order was issued by the government, in which the following well-merited compliment to him occurs:—'His career has been unexampled; for no other servant of the Honourable Company has ever, during so long a period, been constantly employed in the conduct of such various and important military and political duties. His great talents were too well known to admit of their being confined to the range of service under his own presidency. The exercise of them under different situations has connected him with every presidency, and rendered him less the servant of any one of them than of the Indian empire at large.'

Sir J. Malcolm continued to remain in England till 1827, when he was appointed governor of Bombay; but he resigned this office at the end of three years, and again returned to England. He was elected, shortly afterwards, member of parliament for Launceston, and took an active part in the opposition to the Reform Bill. He died on the 31st of May, 1833, of an attack of paralysis. A monument has been erected to his memory in Westminster Abbey, and also an obelisk, 100 feet high, in his native town of Eskdale.

In addition to the works of Sir J. Malcolm, which have been mentioned above, he also wrote an account of the 'Political History of India,' from 1784 to 1823, in 2 vols. 8vo., 1826, and a 'Life of Lord Clive,' which was published after his death, in 1836.

(*Memoir of Sir John Malcolm*, in 'The United Service Journal,' 1833.)

MALDANIANS, or MALDANIDÆ, the second family of sedentary Annelids in Lamarck's system, including *Clymene* and *Dentalium*, which last is not an annelid, according to the latest and best authorities, but a mollusk. [DENTALIUM.] Savigny established the family.

MALDON, a corporate town of considerable antiquity, and a parliamentary borough, in the hundred of Dengie and county of Essex. The town, which is eight miles east from Chelmsford and thirty-four miles north-east from London, is on the right bank of the Chelmer, about a mile above its junction with the Blackwater river. It consists of two principal streets, at right angles to each other; and their cruciform figure has led some authors to suppose that the name of the town itself is derived from the Saxon *Mœldune*, signifying a crossed hill. The circumstance of the town not being now in a flourishing condition is said to be mainly owing to the construction of a canal, called the 'new navigation,' which commences at Collin's Reach, one of the channels into which the Blackwater river is divided by Northey Island; and after passing through the village of Heybridge, joins the Chelmer above Maldon, and is thence continued to Chelmsford, and thus the transit trade to this town has been in a great measure lost. The haven is convenient, and vessels of 200 tons come up to the town during spring-tides. The foreign trade, which in 1832 amounted to 3929 tons inwards and 2199 tons outwards, is declining; but the coasting trade, which in the same year amounted to 69,159 tons inwards and 44,111 tons outwards, appears to be on the increase. In 1823 the receipts of the custom-house were 17,010*l.*; in 1832 they had declined to 7032*l.* The chief part of the property of the corporation has been alienated. The town-council consists of four aldermen and twelve councillors. The charters are numerous, and date from the reign of Henry II. (7th of October, 1155). The parish church of All Saints is a very antient edifice, surmounted by a triangular tower of singular appearance. For a description of its interior, and of the other antiquities of Maldon, the reader is referred to the first volume of Morant's 'History of Essex,' folio, 1768, pp. 327-337. The livings are a vicarage and a curacy, producing a net income of 319*l.* and 165*l.* a year respectively; the latter is in the patronage of the dean and chapter of Westminster. The population of the borough, in 1831, was 3831. The grammar-school was founded by Alderman Breeder in 1608. It has been endowed by several benefactors with funds and landed property; and Dr. Plume, archdeacon of Rochester, and founder of the Plumian professorship of astronomy and experimental philosophy at Cambridge, bequeathed to its use his valuable library of books. The librarian receives a salary of 40*l.* a year. Dr. Plume also established a scholarship of 6*l.* per annum at Christ College, Cambridge, to which boys from the grammar-schools of Chelmsford, Brentwood, and Maldon are successively eligible. Maldon has returned two members to parliament since the reign of Edward III.

(Wright's *History of the County of Essex*, 4to., 1833; *Corporation Reports*, &c.)

MALE FERN, the rhizoma, incorrectly termed root, of the Nephrodium Filix Mas (Richard), Aspidium Filix Mas (Smith), has been celebrated from antient times as an anthelmintic. The rootstock of young plants should be collected in spring or summer, and a fresh supply obtained every year, as a change occurs in the part a few months after being collected. It should be quickly dried, and preserved in glass or earthenware vessels in a dry place. The interior should exhibit a greenish colour, and possess a disagreeable odour, with a bitter, harsh, astringent taste.

It consists of an oil, which may be extracted by sulphuric æther; resin, tannin, sugar, starch, and woody fibre. The oil, which is of two distinct kinds, one pure, and the other united with resin and an extractive, is the active principle. Formerly a powder of the whole substance was administered, but as the dose of this is bulky, Peschier has recommended pills of the æthereal extract, which are found to be very efficacious against that kind of tape-worm which is denominated the *Bothriocephalus latus*, or broad tape-worm. It is scarcely possessed of any power over the Tænia solium. The former infests the small intestines of the inhabitants of Poland, Russia, Switzerland, and some districts of France, in all which countries the male fern has a high reputation as a remedy; but it is not much valued as an anthelmintic in Britain, the broad tape-worm being nearly unknown in this island, though the Tænia solium abounds.

The common mode of administering it is to give a certain number of pills at night, and a like number in the morning, followed by some brisk cathartic, as the male fern only kills, but does not expel the worm. [ANTHELMINTICS.]

MALEBRANCHE, NICOLAS, one of the most illustrious disciples of Des Cartes, who both gave to his master's views a wider development and imparted to them clearness and vivacity, was born at Paris, 1638. Of a sickly and deformed habit of body, Malebranche passed his early youth in retirement and the close study of languages and biblical literature. His attention was first directed to the pursuit of philosophy by accidentally meeting with the work of Des Cartes 'De Homine.' The perusal of this work is said to have excited his susceptible disposition to such a degree that he was several times forced to lay it aside on account of the violent palpitation of his heart. Abandoning his previous literary pursuits, he devoted ten years to the examination of the Cartesian philosophy, and he acquired the reputation of surpassing all his contemporaries in a knowledge of its true spirit and tendency. As the result of his philosophical meditations, Malebranche published, in 1673, the first book of the 'Recherche de la Vérité,' which was quickly followed by the other five. This work thus complete was greatly altered in the several subsequent editions: the most correct and complete edition is that which appeared three years before the author's death, which took place at Paris, in 1715.

The philosophical writings of Malebranche are a model of a style at once elegant and perspicuous, in which neither the clearness of the thought is sacrificed to the graces of composition, nor the ornaments of language to simplicity. If the profound originality of his ideas gained Malebranche any admirers, the novelty and boldness of his assumptions exposed him to much opposition. Among the most famous of his opponents were Foucher, the Jesuit Du Fertre, and Arnaud, who, like Malebranche, was also a member of the Oratory, and at one time his friend and associate.

The object of the 'Recherche de la Vérité' is partly logical and partly metaphysical. On the one hand it investigates the sources of human error, which are reduced to three general heads—sensation, imagination, and the pure intellect (esprit pur). On the other, it attempts to establish some universal method for the investigation and discovery of truth. The source of error however lies not in any imperfection of the cognitive faculties, nor in any incomplete or wrong employment of them, but in the will, which forms its own opinion of the objects presented to it. When, for instance, we see a light or feel warmth, that which is in either case seen or felt is certainly light and warmth, and they are actually perceived, and so far error is impossible; but when, as the will is free to do, it is maintained that the light and warmth of which the subject is percipient exist in the object without, then error arises. Now as all sensuous perceptions are accompanied by pleasure or pain, which chiefly move the will, sensation is the principal source of error, and especially of those false systems of morality which make the highest good to consist in pleasure: for the senses present to the mind nothing but a delusive good, whereas the only true and real good—the Deity—is cognisable by the pure intellect alone.

But the most distinctive point in the system of Malebranche is the assumption by which he explained the possibility of knowledge. For as he followed Des Cartes in making extension to be the essence of matter, and thought of mind, it was necessary for him to account for the possibility of the interaction of two such distinct natures as thought and extension. The existence of ideas in the mind is, according to Malebranche, a fact not requiring to be proved; from this fact however he denies that it follows of necessity that objects corresponding to those ideas do actually exist; for, he observes, the imagination often presents ideas and combinations of ideas which do not exist. Indeed there is no greater hindrance to truth and knowledge than the erroneous belief that ideas refer to actually existing objects. Now all ideas may be classed under two heads: they are either internal, *i.e.* thoughts properly so called, which are therefore mere modifications of the thinking soul; or they are relative to certain external objects of which the soul cannot be cognisant without the mediation of ideas. Now the latter refer to material or spiritual things. External spiritual things may however be perceived both immediately and also mediately by ideas, but the material only mediately, both because they are extended and there is no community between them and the simple spiritual nature of the mind, and because the mind cannot pass out to distant objects. Here Malebranche refutes the hypothesis of material effluxes which pass from bodies and enter through the sensuous organs. Because, he says, these effluvial images must partake of the nature of body, and therefore being extended, they would impede each other in the passage to the senses, since from the same point and at the same time an incalculable number of objects may be perceived. Moreover this hypothesis does not account for the perception of the different distances of objects. Malebranche proceeds, in the next place, to refute the supposition that the mind arbitrarily produces the ideas which it has of outward objects. This is as absurd as to suppose that a painter can delineate an animal which he has never seen or heard described. Equally untenable is the explanation of cognition by innate ideas. For the number of ideas which the mind may entertain is potentially infinite, and it is absurd to suppose that an infinity of ideas have been originally implanted in the mind, of which however most individual minds are actively conscious of a very few at the utmost. Besides, with such a supposition, the choice and selection of ideas would be inexplicable. Again, the supposition that at each operation of thought the ideas are created and presented by God, is contradicted by the fact that the mind can some of which exist in nature, as for example, supermalate of lime is found in the juice of the house-leek.

According to Liebig, malic and citric acids are isomeric bodies, both being composed of, when anhydrous,

Two equivalents of Hydrogen	2
Four equivalents of Carbon	24
Four equivalents of Oxygen	32
Equivalent	58

The crystals contain one equivalent of water; whereas those of citric acid contain different proportions of it, according to the circumstances under which they are formed.

When malic acid is subjected to a heat of about 350° Fah., it is decomposed, and the results are two isomeric pyroacids and water, which are the maleic or equisetic and the fumaric or pyromalic acids.

The malates are not an important class of salts: we shall mention the general properties of a few of them.

Malate of ammonia is a deliquescent salt, but the bimalate is crystallizable, unalterable in the air, and insoluble in alcohol. Malate of potash is a deliquescent mass; the supermalate forms crystals which are unalterable in the air and insoluble in alcohol. Malate of soda is a deliquescent mass, the supermalate crystallizes. Malate of lime is sparingly soluble in water, requiring 147 parts of it cold, and 65 when boiling: the hot solution deposits crystalline grains on cooling. It is stated to be more soluble in some saline solutions than in pure water: the supermalate occurs in houseleek and some varieties of *sedum*; it may be formed by adding acid to the neutral salt; by exposure to heat it dries as a transparent varnish, which distinguishes it from other salts of lime and vegetable acids. It is soluble in water, but insoluble in alcohol. Malate of magnesia yields crystals which are unalterable in the air and are soluble in twenty-eight parts of water; with excess of acid, a gummy deliquescent saline mass is formed. Malate of barytes, both neutral and acidulous, is soluble and gummy; an insoluble subsalt may also be formed. Malate of strontia is gummy and deliquescent, the supersalt is but slightly soluble, but more so in hot than in cold water: the hot solution deposits crystals on cooling. Of the metallic malates we shall state the properties of a few:—Zinc forms three different compounds with this acid: the neutral malate crystallizes in short four-sided prisms; it is soluble in 55 parts of cold water; by boiling water it is decomposed into a supersalt which dissolves, and a subsalt which is precipitated; bimalate of zinc crystallizes in large regular octohedrons; the submalate is an insoluble white powder. Malate of peroxide of iron is a reddish brown-coloured deliquescent mass, soluble both in water and alcohol. Malate of copper, whether neutral or acidulous, dries so as to form a green varnish which is unalterable in the air. The malate of silver is a gummy mass, but the supermalate is a crystallizable salt, which readily separates as such from solution in water. Malate of lead is nearly insoluble in cold water, but dissolves in boiling water, and the solution on cooling deposits brilliant white crystalline scales of this salt.

MALICIOUS INJURIES TO PROPERTY. At common law, mischief perpetrated with whatever motive against the property of another was not punishable criminally, unless the act amounted to felony, was accompanied with a breach of the peace, or affected the public convenience. In other cases the offender was liable only to an action for damages at the suit of the party injured. But the legislature has, at different times, interposed to repress, by penal enactments, injuries to private property of an aggravated nature, committed with the malicious intention of injuring the owner of such property. The different statutory provisions against mischievous acts done wilfully and maliciously were modified, as well as consolidated, by 7 and 8 Geo. IV., c. 30, which also contains a provision rendering it immaterial whether the malice of the offender be against the owner of the property or otherwise.

By the third section of that statute it is made felony [illegible]able by transportation for life or not less than seven [illegible] by imprisonment [illegible]ceeding four years, with or [illegible] a male, to cut, break or [illegible]estroy or [illegible] [illegible]ollen, [illegible] [illegible]ls are [illegible] [illegible]me. of any of those materials mixed with each other or with any other material; or looms, frames, machines, engines, racks, tackles, or implements prepared for or employed in manufacturing or preparing such goods; or to enter by force into any place with intent to commit any of those offences. By section 4, it is made felony punishable by transportation for seven years, or imprisonment not exceeding two years, with or without whipping in case of a male, to cut, break or destroy, or damage with intent to destroy or render useless, threshing-machines, or machines or engines prepared for or employed in manufactures, except those manufactures, &c. injuries to which are more severely punishable under the 3rd section.

By the 6th and 7th sections it is made felony punishable by transportation for seven years, or by imprisonment not exceeding two years, with or without whipping in the case of a male, to cause water to be conveyed into mines, or subterranean passages communicating therewith, or pull down, fill up, or obstruct air-ways, water-ways, drains, pits, levels, or shafts, with intent to destroy, damage, or hinder or delay the working of mines; or maliciously to pull down, or destroy, or damage with intent to destroy or render useless, steam-engines, or engines for making, draining, or working mines, or staiths, buildings, or erections used in conducting the business of mines or bridges, waggon-ways, or trunks for conveying minerals from mines, whether completed or unfinished. By sect. 12 it is made felony punishable by transportation for life or not less than seven years, or by imprisonment not exceeding four years, with or without whipping in the case of a male, to break down or cut down sea-banks or sea-walls, or the banks or walls of rivers, canals, or marshes, whereby lands are overflowed or damaged, or in danger of being so; to throw down, level, or destroy locks, sluices, floodgates, or works on navigable rivers or canals. And by the same section it is made felony punishable by transportation for seven years, or by imprisonment not exceeding two years, with or without whipping in the case of a male, to cut off, draw up, or remove piles, chalk, or other materials fixed in the ground and used for securing sea-banks or sea-walls, or the banks or walls of rivers, canals, or marshes, or to open or draw up flood-gates, or to do other injury or mischief to navigable rivers or canals, with intent or so as to obstruct or prevent the carrying on or completing or maintaining the navigation.

It is made felony, punishable by transportation for life, or not less than seven years, or by imprisonment not exceeding four, with or without whipping in the case of a male, by the 13th section, to pull down or destroy public bridges, or to do any injury with intent or so as to render them dangerous or impassable: and by the 18th section, to cut or destroy hop-binds growing on poles in any hop-plantation. But now (by 7 Wm. IV. and 1 Vict., c. 90, s. 2) the punishment of the latter offence is made transportation not exceeding 15 years and not less than 10 years, or imprisonment not exceeding three. By 7 & 8 Geo. IV., c. 39, s. 14, it is a misdemeanor punishable accordingly [MISDEMEANOR] to throw down, level, or destroy turnpike-gates, or walls, chains, rails, posts, bars, or fences belonging to turnpike-gates set up to prevent passengers passing by without paying toll, or houses, buildings, or weighing-machines for the collection, ascertainment, or security of toll. The 15th section makes it a misdemeanor punishable by transportation for seven years, or by imprisonment not exceeding two years, with or without whipping in the case of a male, to break down or destroy dams of fish-ponds, or of water being private property, or in which is a private right of fishing, with intent to take or destroy fish, or so as thereby to cause the loss or destruction of fish, or to put lime or noxious material in [illegible] with intent to destroy fish, or to break down or [illegible] of mill-ponds. By section 16 it is made felony to [illegible] or wound cattle; but the punishment [illegible] IV. and 1 Vict., c. 90, s. 2, to transportation [illegible] years and not less than 10, or to imprisonment [illegible] ing three. The provisions of the [illegible] & 8 Geo. [illegible] c. 39) relating to the destruction of [illegible] been already noticed. [illegible]

By section 17 it was made felony [illegible] tion for seven years, or by [illegible] with or without whipping [illegible] any crop of [illegible] [illegible] to any less [illegible] Vict., c. 90, [illegible] and they export from Bengal rice, which is not grown on the islands, sugar, silk stuffs, broad-cloth, hardware, and tobacco. They arrive at Calcutta in June or July with the south-western monsoon, and depart from that place in the middle of December with the north-east monsoon.

(Horsburgh, Owen, and Moresby, in the *London Geographical Journal*, vols. ii. and v.)

MALEIC ACID has already been described under the name of EQUISETIC ACID; the present appellation is given in consequence of its having been since procured by subjecting malic acid to heat. It is composed of—

One equivalent of Hydrogen	1
Four equivalents of Carbon	24
Three equivalents of Oxygen	24
	—
Equivalent	49
The crystals contain one equivalent of water . . .	9
	—
Equivalent	58

MALENTOZOA'RIA, articulated Mollusca, the second subtype in the system of M. de Blainville. [MALACOLOGY, p. 324.]

MALESHERBES, CHRETIEN GUILLAUME DE LAMOIGNON, distinguished by his courage and misfortunes, the associate of Turgot and those illustrious statesmen who sought by moderate and beneficial reforms to prop the weakness of the old monarchy, was born at Paris, 16th Dec. 1721. His father was chancellor of Paris, and Malesherbes, after finishing the course of legal study, was first appointed deputy to the procureur-général. Shortly afterwards he was elected a counsellor of the parliament of Paris, and in 1750 president of the Cour des Aides. In this office, he on the one hand courageously resisted the extravagant expenditure of the court, and on the other put a stop to the frauds and peculations of the farmers-general of the revenue. When, in consequence of their opposition to the court, the parliaments were abolished by Louis XV., the Cour des Aides was also abrogated, and Malesherbes retired to his country-seat, and employed himself in benevolent plans for the education and improvement of his vassals. Upon the restoration of the constitutional courts of the parliaments by Louis XVI., Malesherbes resumed his duties as president of the Cour des Aides; and in the following year (1775) he was appointed minister of the king's household. Upon the retirement of Turgot, Malesherbes also tendered his resignation to the king, which was accepted. The interval between this date and the troubles which preceded the outbreak of the Revolution Malesherbes devoted to a tour of inspection through his native country, Switzerland, and Holland, acquainting himself with the state of industry and the arts, and carefully investigating the nature and efficiency of their public institutions. He was again invited by the king to aid him with his counsel in 1787; but finding that he had no power, and that his advice was not listened to, he again retired just before the meeting of the states-general. When Louis XVI. was brought to trial, Malesherbes claimed the honourable but dangerous post of his defender, and was associated with Tronchet and Desèze. The fearless intrepidity of Malesherbes entailed upon him the hatred and suspicions of the party in power, and, with several members of his family, he was cast into prison, condemned to death, and guillotined on the 22nd of April, 1794, meeting his fate with cheerfulness and resignation.

The works of Malesherbes, who was a member of the French Academy and of the Academy of Belles Lettres and Inscriptions, are mostly on subjects of natural history and rural economy. His 'Discours et Remonstrances,' printed in 1779, are still quoted as authorities on financial questions. His 'Mémoire sur la Liberté de la Presse' particularly deserves mention for the enlightened view which it takes upon this difficult question, the more especially as the tolerance and liberality which it advocates had been practised by himself when the surveillance of the press was entrusted to him. On this ground he incurred the censures of the ultra party, and La Harpe expressly ascribes the excesses of the Revolution to the facility of publication under Malesherbes' ministry of the press. After the Restoration a monument to the memory of Malesherbes was erected by Louis XVIII. in the hall of the Chamber of Justice, with the inscription, 'Strenue semper fidelis regi suo, in solio veritatem, præsidium in carcere attulit.'

MALESHERBIA'CEÆ, a natural order of polypetalous Exogens, with a tubular inflated inferior calyx, within the throat of which are inserted five petals, five or ten stamens, and a short rim or crown of the same nature as that of Passifloraceæ, but more rudimentary. The ovary is stipitate, superior, one-celled, with parietal or free placentation. The order is therefore nearly allied to Passifloraceæ, from which however it differs in habit. The species are in many cases remarkable for the beauty of their yellow or blue flowers, and have been cultivated in this country, their seeds having been brought from Chili. They are however seldom seen, and are of no known use. (Lindl., *Nat. Syst.*, ed. 2, 71.)

MALHERBE, FRANÇOIS DE, born in 1555, at Caen, in Normandy, of a noble family, studied first in his native town, and afterwards at Heidelberg and Basel. On his return to France, he accompanied Henri of Angoulême, son of Henri II., who went to Provence as governor in 1579, and remained attached to his household till that prince's death in 1585. During that period he married at Aix in Provence, and settled there. He afterwards served in the army during the wars of the League. In the year 1600 he wrote an ode on the arrival in France of Marie de' Medicis, the wife of Henri IV. With this ode his poetical reputation began. In 1605, having come to Paris on private business, Henri IV. sent for him, praised his poetry, and provided him with the means of remaining at court. After the death of the king, his widow Marie de' Medicis gave him a pension in consequence of an ode which he addressed to her. In 1527 he had the misfortune to lose his only surviving son in a duel. He felt the loss severely, and took steps to bring the offenders to justice. He even wrote a letter to Louis XIII., in which he demanded satisfaction. This letter is published among his works. Malherbe having repaired to the camp before La Rochelle, where the court was then pressing the siege of that place, he fell ill, and died in a few days, in 1628, being 73 years of age.

Malherbe has been styled by competent judges the restorer of the French language and poetry. He had a delicate ear and a refined taste, and he was very careful in the choice of his expressions. The eulogium bestowed upon him by Boileau is well known:—

> 'Enfin Malherbe vint, et le premier en France
> Fit sentir dans les vers une juste cadence.'

Malherbe's poetry is more remarkable for gracefulness of expression than for power of thought. He was an elegant versifier rather than a real poet. (*Poésies de Malherbe, rangées par ordre chronologique, avec la Vie de l'Auteur*, Paris, 1776.)

MALIC ACID was discovered in 1785 by Scheele. It received its name from having been first obtained from the juice of apples, in which it exists in considerable quantity, and also, as has been since ascertained, in various other fruits, as cherries, raspberries, strawberries, in house-leek, and the berries of the sorbus or mountain-ash. Mr. Donovan, who procured it from the last-mentioned source, obtained it of so great purity that he supposed it to be a new and peculiar acid, which he called sorbic acid; but it has since been proved to be identical with the malic. A mucilaginous substance which accompanies the acid obtained from apples prevents its properties from being perfectly and readily developed.

Various processes have been proposed for procuring this acid, and they are generally complicated: the following is perhaps as good as any, and is proposed by Liebig:—add carbonate of lime, but not to perfect saturation, to the expressed juice of the sorbus; the solution is to be decomposed by nitrate of lead, which precipitates malate of lead; this, after washing with cold water, is to be heated with boiling dilute sulphuric acid, and the resulting mass with sulphuret of barium, by which there are formed sulphuret of lead and sulphate of barytes, while the clear liquor contains malic acid, to which ammonia is then added to convert it into bimalate of ammonia, which readily crystallizes; this salt is to be precipitated by acetate of lead, and the resulting malate of lead decomposed by hydrosulphuric acid; the clear liquor, separated from the sulphuret of lead, being evaporated by a gentle heat, yields crystals of malic acid, which are not however regular in their form. Malic acid is colourless, inodorous, very sour to the taste, and acts strongly on vegetable blues; in a moist air it is deliquescent; it is very soluble both in water and in alcohol. Nitric acid converts it into oxalic acid. Its saline compounds are called malates some of which exist in nature, as for example, supermalate of lime is found in the juice of the house-leek.

According to Liebig, malic and citric acids are isomeric bodies, both being composed of, when anhydrous,

Two equivalents of Hydrogen	2
Four equivalents of Carbon	24
Four equivalents of Oxygen	32
	—
Equivalent	58

The crystals contain one equivalent of water; whereas those of citric acid contain different proportions of it, according to the circumstances under which they are formed.

When malic acid is subjected to a heat of about 350° Fah., it is decomposed, and the results are two isomeric pyro-acids and water, which are the maleic or equisetic and the fumaric or pyromalic acids.

The malates are not an important class of salts: we shall mention the general properties of a few of them.

Malate of ammonia is a deliquescent salt, but the bimalate is crystallizable, unalterable in the air, and insoluble in alcohol. Malate of potash is a deliquescent mass; the supermalate forms crystals which are unalterable in the air and insoluble in alcohol. Malate of soda is a deliquescent mass, the supermalate crystallizes. Malate of lime is sparingly soluble in water, requiring 147 parts of it cold, and 65 when boiling: the hot solution deposits crystalline grains on cooling. It is stated to be more soluble in some saline solutions than in pure water: the supermalate occurs in houseleek and some varieties of *sedum*; it may be formed by adding acid to the neutral salt; by exposure to heat it dries as a transparent varnish, which distinguishes it from other salts of lime and vegetable acids. It is soluble in water, but insoluble in alcohol. Malate of magnesia yields crystals which are unalterable in the air and are soluble in twenty-eight parts of water; with excess of acid, a gummy deliquescent saline mass is formed. Malate of barytes, both neutral and acidulous, is soluble and gummy; an insoluble subsalt may also be formed. Malate of strontia is gummy and deliquescent, the supersalt is but slightly soluble, but more so in hot than in cold water; the hot solution deposits crystals on cooling. Of the metallic malates we shall state the properties of a few:—Zinc forms three different compounds with this acid: the neutral malate crystallizes in short four-sided prisms; it is soluble in 55 parts of cold water; by boiling water it is decomposed into a supersalt which dissolves, and a subsalt which is precipitated; bimalate of zinc crystallizes in large regular octohedrons; the submalate is an insoluble white powder. Malate of peroxide of iron is a reddish brown-coloured deliquescent mass, soluble both in water and alcohol. Malate of copper, whether neutral or acidulous, dries so as to form a green varnish which is unalterable in the air. The malate of silver is a gummy mass, but the supermalate is a crystallizable salt, which readily separates as such from solution in water. Malate of lead is nearly insoluble in cold water, but dissolves in boiling water, and the solution on cooling deposits brilliant white crystalline scales of this salt.

MALICIOUS INJURIES TO PROPERTY. At common law, mischief perpetrated with whatever motive against the property of another was not punishable criminally, unless the act amounted to felony, was accompanied with a breach of the peace, or affected the public convenience. In other cases the offender was liable only to an action for damages at the suit of the party injured. But the legislature has, at different times, interposed to repress, by penal enactments, injuries to private property of an aggravated nature, committed with the malicious intention of injuring the owner of such property. The different statutory provisions against mischievous acts done wilfully and maliciously were modified, as well as consolidated, by 7 and 8 Geo. IV., c. 30, which also contains a provision rendering it immaterial whether the malice of the offender be against the owner of the property or otherwise.

By the third section of that statute it is made felony punishable by transportation for life or not less than seven years, or by imprisonment not exceeding four years, with or without whipping in the case of a male, to cut, break or destroy, or damage with intent to destroy or to render useless, any goods or articles of silk, woollen, or linen, or of articles, in which any of those materials are mixed, or any frame-work-knitted piece, stocking, hose, or lace, in any stage of manufacture; to cut, break or destroy, or render useless warps or shoots of silk, woollen, linen or cotton, or of any of those materials mixed with each other or with any other material; or looms, frames, machines, engines, racks, tackles, or implements prepared for or employed in manufacturing or preparing such goods; or to enter by force into any place with intent to commit any of those offences. By section 4, it is made felony punishable by transportation for seven years, or imprisonment not exceeding two years, with or without whipping in case of a male, to cut, break or destroy, or damage with intent to destroy or render useless, threshing-machines, or machines or engines prepared for or employed in manufactures, except those manufactures, &c. injuries to which are more severely punishable under the 3rd section.

By the 6th and 7th sections it is made felony punishable by transportation for seven years, or by imprisonment not exceeding two years, with or without whipping in the case of a male, to cause water to be conveyed into mines, or subterranean passages communicating therewith, or pull down, fill up, or obstruct air-ways, water-ways, drains, pits, levels, or shafts, with intent to destroy, damage, or hinder or delay the working of mines; or maliciously to pull down, or destroy, or damage with intent to destroy or render useless, steam-engines, or engines for making, draining, or working mines, or staiths, buildings, or erections used in conducting the business of mines or bridges, waggon-ways, or trunks for conveying minerals from mines, whether completed or unfinished. By sect. 12 it is made felony punishable by transportation for life or not less than seven years, or by imprisonment not exceeding four years, with or without whipping in the case of a male, to break down or cut down sea-banks or sea-walls, or the banks or walls of rivers, canals, or marshes, whereby lands are overflowed or damaged, or in danger of being so; to throw down, level, or destroy locks, sluices, floodgates, or works on navigable rivers or canals. And by the same section it is made felony punishable by transportation for seven years, or by imprisonment not exceeding two years, with or without whipping in the case of a male, to cut off, draw up, or remove piles, chalk, or other materials fixed in the ground and used for securing sea-banks or sea-walls, or the banks or walls of rivers, canals, or marshes, or to open or draw up flood-gates, or to do other injury or mischief to navigable rivers or canals, with intent or so as to obstruct or prevent the carrying on or completing or maintaining the navigation.

It is made felony, punishable by transportation for life, or not less than seven years, or by imprisonment not exceeding four, with or without whipping in the case of a male, by the 13th section, to pull down or destroy public bridges, or to do any injury with intent or so as to render them dangerous or impassable; and by the 18th section, to cut or destroy hop-binds growing on poles in any hop-plantation. But now (by 7 Wm. IV. and 1 Vict., c. 90, s. 2) the punishment of the latter offence is made transportation not exceeding 15 years and not less than 10 years, or imprisonment not exceeding three. By 7 & 8 Geo. IV., c. 39, s. 14, it is a misdemeanor punishable accordingly [Misdemeanor] to throw down, level, or destroy turnpike-gates, or walls, chains, rails, posts, bars, or fences belonging to turnpike-gates set up to prevent passengers passing by without paying toll, or houses, buildings, or weighing-machines for the collection, ascertainment, or security of toll. The 15th section makes it a misdemeanor punishable by transportation for seven years, or by imprisonment not exceeding two years, with or without whipping in the case of a male, to break down or destroy dams of fish-ponds, or of water being private property, or in which is a private right of fishing, with intent to take or destroy fish, or so as thereby to cause the loss or destruction of fish, or to put lime or noxious materials in ponds with intent to destroy fish, or to break down or destroy dams of mill-ponds. By section 16 it is made felony to kill, maim, or wound cattle; but the punishment is reduced by 7 Will. IV. and 1 Vict., c. 90, s. 2, to transportation not exceeding 15 years and not less than 10, or to imprisonment not exceeding three. The provisions of this statute (7 & 8 Geo IV., c. 39) relating to the destruction of trees, plants, &c. have been already noticed. [Larceny.]

By section 17 it was made felony punishable by transportation for seven years, or by imprisonment not exceeding two, with or without whipping in the case of a male, to set fire to any crop of corn, grain, or pulse, whether standing or cut down, or to any part of a wood, coppice, or plantation, or to any heath, gorze, furze, or fern, and by 7 Wm. IV. and 1 Vict., c. 89, it is made felony punishable by transportation for life or not less than 15 years, or by imprisonment not exceeding three (sect. 10), to set fire to any stack of corn, grain, pulse, tares, straw, haulm, stubble, furze, heath, fern, hay, turf, peat, coals, charcoal, or any steer of wood, or (sect. 11) to set fire to any mine of coal or cannel coal.

The enactments in this statute with respect to the burning of houses, &c. [ARSON] have been repealed; and now by 7 Wm. IV. and 1 Vict., c. 89, sect. 2, it is felony punishable by death to set fire to a dwelling-house, any person being therein, and by sect. 3 it is felony punishable by transportation for life, or not less than 15 years, or by imprisonment not exceeding three, to set fire to a church or chapel, or a chapel for the religious worship of dissenters, or to a house, stable, coach-house, outhouse, warehouse, office, shop, mill, malthouse, hop-oast, barn, or granary, or to a building used in carrying on trade or manufacture, whether in the possession of the offender or of any other person, with intent to injure or defraud any person.

For the protection of shipping against malicious mischief several statutory provisions have been made. By 1 and 2 Geo. IV., c. 75, sect. 11, it is felony punishable by transportation for seven years, or imprisonment for any number of years, to cut away, cast adrift, alter, deface, sink, or destroy, or do any act with intent to cut away, cast adrift, remove, alter, deface, sink, or destroy, or injure or conceal buoys, buoy-ropes, or marks belonging to ships or vessels, whether in distress or otherwise. By 7 Geo. IV., c. 30, sect. 10, it is made felony punishable by transportation for seven years, or by imprisonment not exceeding two, with or without whipping in the case of a male, to damage otherwise than by fire (which offence had been made capital by sect. 9) ships or vessels complete or unfinished, with intent to destroy them or to render them useless.

By 7 Wm. IV. and 1 Vict., c. 89, sect. 5, it is made felony punishable by death to exhibit false lights or signals with intent to bring any ship or vessel into danger, or to do any thing tending to the immediate loss or destruction of ships or vessels in distress. And by sect. 6 it is made felony punishable by transportation for life, or not less than 15 years, or by imprisonment not exceeding three years, to set fire to, cast away, or destroy ships or vessels, with intent to prejudice owners or part-owners of vessels or goods, or underwriters on ships, goods, or freight. And by the 4th sect. it is made felony punishable by death, to set fire to, cast away, or destroy any ship or vessel, either with intent to murder any person or whereby the life of any person shall be endangered.

Besides the criminal responsibility thus created in respect of the acts of spoliation above enumerated, the legislature has given summary relief to persons whose property has been subject to petty but wilful aggressions. The last enactment on this subject is 7 and 8 Geo. IV., c. 30, sect. 24, under which persons wilfully or maliciously committing damage, injury, or spoil, to or upon real or personal property, for which no remedy or punishment is specially provided by that act, are, on conviction before a justice of the peace, to forfeit and pay such sum of money as shall appear to him a reasonable compensation for the damage, injury, or spoil committed, not exceeding 5*l.*, to be paid, in the case of private property, to the party aggrieved, except where such party is examined in proof of the offence; and in such cases or in the case of property of a public nature, or wherein any public right is concerned, the money is to be applied towards the county-rate or borough-rate; and if such sums of money together with costs (if ordered) are not paid either immediately or within such period as the justice may appoint, the justice may commit the offender to the common gaol or house of correction, to be kept to hard labour for any term not exceeding two calendar months, unless such sum and costs be sooner paid. This enactment does not extend to any case where the party trespassing acted under a fair and reasonable supposition that he had a right to do the act complained of, or to any trespass, not being wilful and malicious, committed in hunting, fishing, or in the pursuit of game.

By the 28th section any person found committing any offence against this act, whether punishable upon indictment or upon summary conviction, may be immediately apprehended without a warrant, by any peace-officer, or the owner of the property injured, or his servant, or any person authorized by him, and forthwith taken before some neighbouring justice of the peace.

These summary proceedings before magistrates must be commenced within three calendar months from the commission of the offence.

The provisions of the law of France with respect to malicious injuries to property are to be found in the 3rd section of liv. iii. of the Code Pénal, entitled 'Destructions, Dégradations, Dommages.' Capital punishment is denounced only against those who set fire to buildings, ships, warehouses, wood-yards (chantiers), forests, underwoods, or crops growing or cut down, or to any combustible matter placed so as to communicate fire thereto. Minor offences in forests are provided for by titre 12 of the Code Forestier.

MALINES. [MECHLIN.]

MALLEABILITY is that property of certain metals which admits of their being extended by the blows of a hammer or by pressure. In this quality gold exceeds all other metals: thus the gold-leaf sold in books is so extremely thin, that less than 5 grains cover about 270 square inches, and the thickness of each leaf does not exceed $\frac{1}{200000}$th part of an inch. Metals which are malleable are also ductile, that is, they may be drawn into wire. [METALS.]

According to Dr. Thomson, malleability and ductility seem to depend upon a certain quantity of latent heat in the metals which possess these properties. During the hammering they become hot, sometimes even red hot, and after this many of them become brittle, owing to the forcing out of the latent heat which they contained. By annealing, which consists in heating them artificially and allowing them to cool slowly, the heat is restored, and they recover their malleability and ductility; and thus it is that iron which has been made hot by hammering loses its malleability, and cannot be again hammered till it has been annealed.

MALLEA'CEA, or MA'LLEIDÆ, a family of Monomyarian Conchifers according to the system of Lamarck, most of the genera of which are to be found in the family *Margaritacea* of De Blainville. They belong to the *Ostracea* of Cuvier, and the Oxygones of Latreille. Lamarck makes the family consist of five genera only:—*Crenatula*, *Perna*, *Malleus*, *Avicula*, and *Meleagrina*.

Animal, with the *mantle* non-adherent, entirely open in its whole circumference, without tube or particular opening, prolonged into irregular lobes, especially backwards; *foot* canaliculated, and almost always furnished with a byssus.

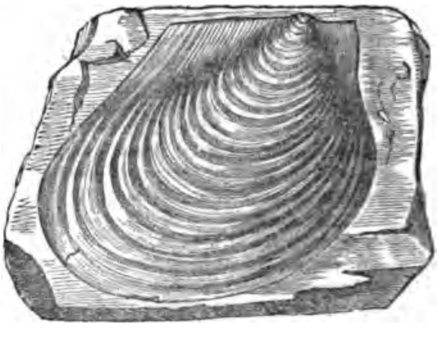
Shell black or horn colour, inequivalve, inequilateral, very irregular; *hinge* without teeth; marginal ligament sublinear, simple, or interrupted by crenulations; *muscular impression* subcentral, fixed generally by a byssus furnished by the animal.

M. Rang places the fossil genus *Posidonia* at the head of the family, so that the position of that genus is approximated to *Lima*, which is arranged as the last of the *Pectinidæ*.

Genera. Posidonia (Bronn).

Animal unknown.

Shell very delicate, nearly membranous, equivalve, inequilateral, oblique, rounded, not gaping? cardinal border straight, a little prolonged on each side, so as to be auriculated; *hinge* toothless; no pit for the ligaments; nor passage for a byssus.



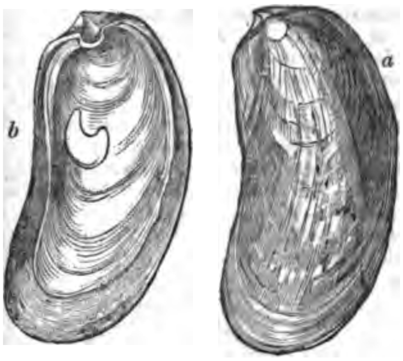
Posidonia (from specimens in Irish limestone).

M. Rang remarks that this genus had been recently (1829) established for impressions sufficiently common in the schists of Dillemburg, and which some naturalists had been tempted to refer to rudimentary shells of Aplysia or Pleurobranchus. M. Rang agrees with M. Bronn in opinion,

ese are the impressions of bivalve shells, and assigns
donia the position above stated. M. Deshayes how-
ı the last edition of Lamarck (1836), does not men-
ə genus among the Malleacea.

Vulsella. (Lam.)

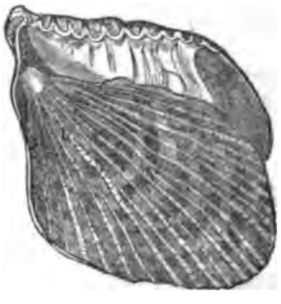
ıal elongated, compressed; *mantle* very much pro-
backwards, and bordered with two rows of papillary
es which are very close set; *foot* small, canaliculated,
t a byssus; mouth large, labial appendages very much
ɔed and triangular; branchiæ narrow, very long, and
nearly throughout their extent.
l subcorneous, delicate, elongated, flattened, irregu-
ɿuilateral, subequivalve, the umbones nearly anterior,
, and a little recurved; *hinge* toothless, and offering
on each valve a projecting callosity comprehending a
the insertion of the ligament; *muscular impression*
tral.
raphical Distribution of the Genus.—The seas of
limates, where the species, none of which are furnished
byssus, are found in *Alcyonia*, sponges, &c.
nple, *Vulsella lingulata.* *Locality.*—East Indian



Vulsella lingulata.
ɔa, closed; *b*, inside view of valve, showing the hinge and muscular
n.

Crenatula. (Lam.)

ıal not known, but very probably bearing a close re-
o that of Perna.
' foliated, flattened, subequivalve, inequilateral, irre-
ı little gaping behind, but without any aperture for a
hinge linear, marginal, marked with serial crenu-
which are callous and hollowed into rounded pits
reception of the divisions of the ligament; muscular
ıion subcentral.
raphical Distribution of the Genus.—The seas of
:limates, principally those of the East Indies and
olland, as far as is yet known. The species, which
numerous, are not fixed by their valves nor by a bys-
t, like the Vulsellæ, are found in submarine bodies,
sponges, &c.
nple, *Crenatula aviculoïdes.* *Locality.*—Seas of
:a, especially those of the South.



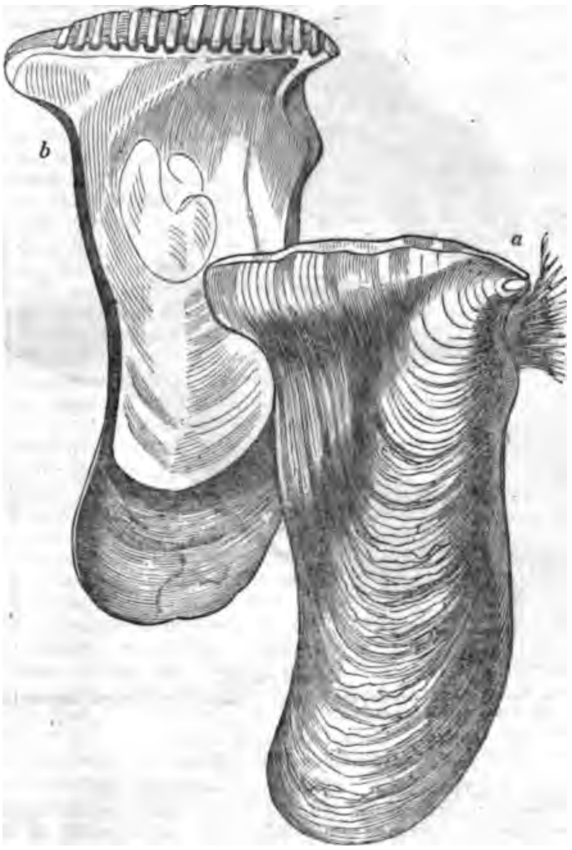
Crenatula aviculoides.

Perna. (Brug.)

nal compressed; *mantle* very much prolonged back-
and fringed at its lower border; *foot* very small, with
us.
ll corneous or black, lamellar, very much flattened,
ıivalve, inequilateral, very irregular, gaping in front
ɪ passage of the byssus; *hinge* straight, marginal, having on each side a row of small parallel furrows, which are transverse, not intrant, and in which the divisions of the ligament are inserted; muscular impression subcentral.

Geographical Distribution of the Genus.—The seas of warm climates, more particularly those of the East Indies, though some species are found westward, as at the Antilles, Cape Verd, and the Azores. The species are moored to the rocks and mangrove trees by means of their byssus, and have been found at depths ranging from the surface to ten fathoms.

Example, *Perna Isognomum.* *Locality.*—East Indian Ocean.



Perna Isognomum.
a, Valves closed, showing the byssus; *b*, inside view of valve, showing hinge and muscular impression.

Malleus. (Lam.)

Animal considerably compressed; *mantle* prolonged backwards, and fringed with very small tentacular appendages; *foot* very distinct, canaliculated, and furnishing a byssus; buccal appendages spherico-triangular; *branchiæ* short and semicircular.

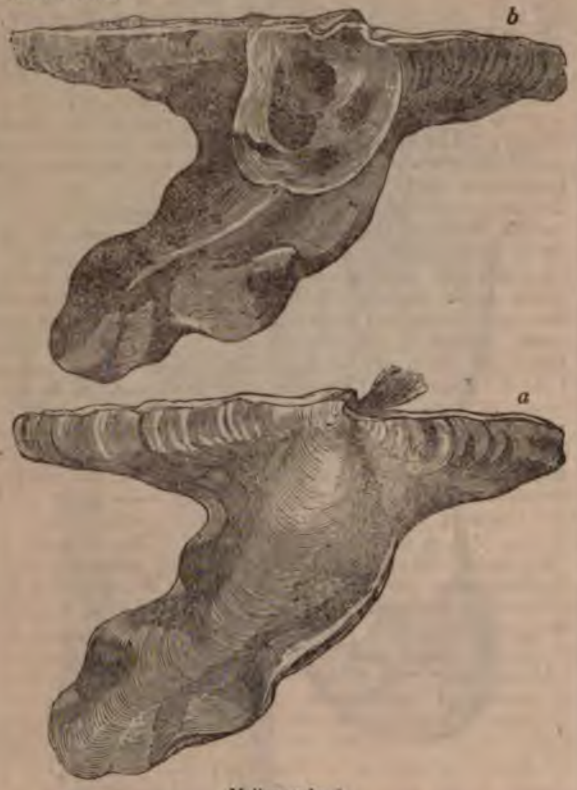
Shell foliated, black or corneous, subnacreous, subequivalve, inequilateral, very irregular, often auriculated, and presenting a hammer or T shape; umbones not distant; an oblique notch in front for the passage of a byssus; *hinge* linear, very long, toothless; with a conical oblique pit, partially external, for the reception of the ligament, which is triangular and subexternal; muscular impression of considerable size and subcentral.

Geographical Distribution of the Genus.—East and West Indies (Guadaloupe and Martinique) and Australasia. Found at depths ranging from the surface to seven fathoms. M. Rang speaks of the species from Guadaloupe and Martinique as having occurred at great depths. The species, which are not numerous, are moored by their byssus to submarine rocks, &c. They are very variable, and indeed M. Deshayes observes that he never saw any two individuals of a species alike. Age makes a considerable change in the shape of the shells, especially in the auricles.

M. de Blainville divides the genus into three sections:—1, consisting of species scarcely auriculated (*Malleus vulsellatus*); 2, consisting of uniauriculated species (*Malleus normalis*); and 3, consisting of biauriculated species (*Mal-*

leus vulgaris). M. Deshayes thinks that the greater part of the individuals occurring in collections under the name of *Malleus vulsellatus* may be the young of the variety of *Malleus vulgaris* with short ears, and he considers *Malleus vulsellatus* and *Malleus anatinus* as identical.

Example, *Malleus vulgaris*. *Locality*.—East Indian and South Seas.



Malleus vulgaris.

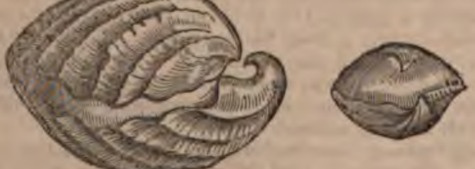
a, Valves closed, showing the byssus; *b*, inside view of valve, showing the hinge and muscular impression.

Gervillia (Fossil only).
(See the article, vol. xi.)

Inoceramus. (Parkinson.)—(Fossil only.)

See the article, vol. xii. Though some malacologists consider Inoceramus and Catillus to be identical, M. de Blainville, M. Rang, and M. Deshayes consider them as distinct species, and as belonging to this family. M. Deshayes gives the following description of *Inoceramus*.

Shell gryphoïd, inequivalve, irregular, subequilateral, with a lamellar shell, pointed anteriorly, and enlarged at its base; umbones opposed, pointed, and strongly recurved; *hinge* short, straight, narrow, and forming a right angle with the longitudinal axis, with a series of crenulations gradually smaller for the reception of a multiple ligament. Muscular impression unknown. The species are of moderate size.



Inoceramus sulcatus, nat. size; from the Folkstone blue marl. The smaller specimen shows the hinge of one valve, the other valve being a cast.

Localities.—Dr. Mantell records several species in the *Chalk*, two in the *Chalk-marl*, two in the Gault or Folkstone Marl, and one (from Martin) in the *Shanklin Sand* (Lower Green-sand). (*Organ. Remains of Sussex*, 'Geol. Trans.,' 1829.) N.B. Some of the species in the chalk—*Inocerami Brongniarti*, *Lamarckii*, and *Mytiloides*—are *Catilli*. Professor Phillips records three (one a *Catillus*) in the *White Chalk*, one in the *Red Chalk*, and one in the *Lias*. (*Geology of Yorkshire*.) Mr. Lonsdale notices two in the Lower Chalk (Oolitic District of Bath). Dr. Fitton records six named species and one undetermined *Upper Green-sand*, *Gault*, and *Lower Green-sand*, *between the Chalk and Oxford Oolite*, in *Geol. Tran*

Example, *Inoceramus sulcatus*.

Catillus. (Brongn.)—(Fossil only.)

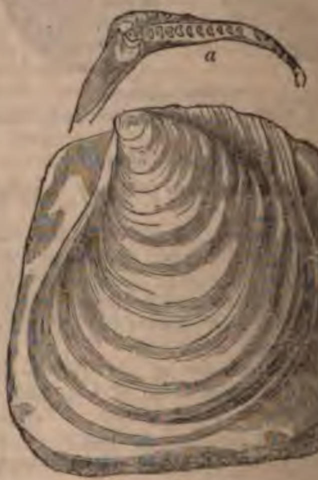
M. Deshayes thus defines Catillus, which is re this work from that title to MARGARITACEA; we agree with the authors above quoted in thinking proper place for the genus.

Shell sometimes flattened, elongated, or sub sometimes convex, cordiform, subequivalve, ineq with umbones more or less projecting. Hinge st little oblique or perpendicular to the longitudinal border furnished with a row of small cavities w very short and gradually increasing; structure fibrous; muscular impression unknown.

M. Deshayes observes that among the genera by Mr. Sowerby in his *Min. Con.* there is one to has given the name of *Pachymya*; this genus a M. Deshayes to possess all the external char *Catillus*, and he states that he has been led to ren approximation of that genus to *Catillus* by studyi specimen in the collection of M. Duchastel. M. proceeds to observe that M. Brongniart has estal genus under the name of *Mytiloïdes* for those *Cati* are very much elongated, and that consequently th *Mytiloïdes* cannot be retained. The genus *Catil* as reformed by M. Deshayes, will consist of th *Pachymya*, *Mytiloïdes*, and *Catillus*. Some of th are of enormous size, and are mentioned as being feet in length. M. Deshayes thinks that the an *Inoceramus* and *Catillus* both wanted a byssus.

Localities.—The *White Chalk* in England and F

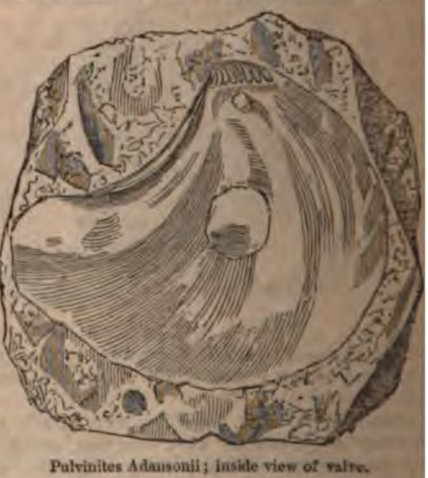
Example, *Catillus Cuvieri*.



Catillus Cuvieri.

a, The hinge.

Pulvinites. (Defrance.)—(Fossil only.)



Pulvinites Adansonii; inside view of valve.

Animal unknown.

Shell delicate, rounded, equivalve, subequilateral, with the umbones inclined a little forwards; *hinge* composed of eight or ten divergent teeth, forming so many pits.

The genus *Avicula*, which is placed by Lamarck among his *Malleacea*, but is arranged by M. de Blainville, with many of the genera above described, under his family *Margaritacea*, is separated by M. Rang into a family which immediately succeeds the Malleïdæ, under the name of *Aviculés*, containing the subgenera *Avicula* (properly so called) and *Meleagrina*. See the article AVICULA, vol. iii., to which we think it right to add the description of the animal by M. Deshayes.

Animal oval, flattened, having the lobes of the *mantle* separated throughout their length, thickened, and fringed on the edges; body very small, having on each side a pair of large branchiæ, nearly equal; mouth oval, rather large, with foliaceous lips, and with a pair of labial palps on each side, which are large and obliquely truncated; *foot* conical, vermiform, rather long, with a rather large byssus composed of stout filaments, united in some species, at its base.

M. Deshayes also concurs in merging the genus *Meleagrina* in that of *Avicula*, which, according to M. Deshayes's reformation of the genus, will contain also the fossil genus *Monotis* of Bronn.

FOSSIL MALLEIDÆ.

Those species which are fossil only are noticed above.

Vulsella.—M. Deshayes, in his Tables (Lyell), gives the number of recent species as five and one fossil (tertiary). In the last edition of Lamarck he makes the recent species six, with no addition to the fossil species. (Grignon, Lamarck, Paris, Deshayes.)

Perna.—The number of recent *Pernæ* given by M. Deshayes, in his Tables, amounts to ten recent and four fossil (tertiary). In the last edition of Lamarck, the same recent number is stated, but the fossil species amount to six. (Virginia, Alsace, and the neighbourhood of Hâvre, Italy, Hauteville, and Valognes, the Kimmeridge Clay, Germany and France, the Valmondois and Senlis.) Professor Phillips notes one (*Perna quadrata*, not mentioned by Lamarck or Deshayes) in the *Coralline Oolite* (Malton), and also in the *Bath Oolite*. He also notices a *Perna* in the Oxford Clay. (*Geology of Yorkshire.*) The genus is recorded in the *Inferior Oolite*, and in the *Coral Rag*, by Mr. Lonsdale (*Oolitic District of Bath*, in *Geol. Trans.*), and by Dr. Fitton, in the *Lower Green-sand* and the *Blackdown Sands*.

We here give a notice of the fossil *Aviculæ*.

M. Deshayes, in his Tables, states the number of recent *Aviculæ* (including *Meleagrinæ*) at thirty, and gives five as the number of fossil (tertiary). In the last edition of Lamarck he makes the number of recent *Aviculæ* twenty-one, and the number of fossil species six. (Paris, Grignon, Senlis, &c., Chaumont, Paris Basin, Maastricht, and Cypi[illegible] the *Cornbrash* in England and France, the Middle and Upper *Oolite* in England and France, and the Muschelkalk in Germany, Lorraine, and Toulon.) The *Meleagrinæ* are two in number, both recent. Dr. Mantell mentions species in the Chalk Marl. (*Organic Remains* [illegible] *Sussex.*) Professor Phillips records species in the [illegible] ne Oolite and Calcareous Grit, in the Oxford Clay, [illegible] ways Rock, Bath Oolite, Inferior Oolite, and [illegible] (*Geology of Yorkshire.*) Mr. Lonsdale notices [illegible] Lias, Inferior Oolite, Fuller's Earth, Bradford [illegible] brash, and Kelloway Rock. (*Oolitic District* [illegible]) [illegible] Sedgwick and Mr. Murchison [illegible] the Gosau [illegible] species [illegible]

pointed tutor to the sons of the duke of Montrose, with whom he made the tour of Europe. He first became known as a writer by the publication of his ballad of 'Margaret's Ghost,' or, as it was originally entitled, 'William and Margaret,' which appeared anonymously in the 36th No. of Aaron Hill's 'Plain Dealer,' 14th July, 1724. There has been some controversy however as to Mallet's claim to more than the re-casting of this famous ballad. (See Percy's 'Reliques of antient English Poetry,' 1794, vol. iv., 332-336, where the ballad is given in the shape in which it was finally published by Mallet, in his collected works, 1759: 'The Hive,' a collection of songs, vol. i., 1724, where at p[illegible] is given as it had appeared the same year in the 'P[illegible] Dealer;' 'The Hive,' vol. iii., published in 17[illegible] p. 157, is given the other poem, which has [illegible] controversy as to the originality of Mallet's [illegible] Friends,' 1773, vol. i., where the attempt was [illegible] convict Mallet of plagiarism.) He now [illegible] ternal name, and took that of Mallet, which [illegible] imagined had more of an English sound [illegible] suited to his ambition to be taken [illegible] Britain: the earliest known mention of his [illegible] name in print is said to occur [illegible] lished his poem of the 'Excursion' [illegible] 1731 his tragedy of 'Eurydice' was per[illegible] lane, but very indifferently received [illegible] 'Verbal Criticism,' which he so [illegible] some importance to his fortunes [illegible] acquaintance of Pope, and through [illegible] friend Bolingbroke. Through these [illegible] the situation of private secretary [illegible] Wales, with a salary of [illegible] 'Mustapha' was acted at Drury [illegible] for the greater part of which [illegible] debted to some satirical [illegible] Walpole. The next year [illegible] wrote, in conjunction with [illegible] 'Alfred,' which was performed [illegible] in honour of the [illegible] daughter. It was [illegible] e and acted at Drury [illegible] d, Of Mallet's [illegible] ore Bacon,' of [illegible] and Works, [illegible] ne; Theodora [illegible] y Drury-lane [illegible] sup- at least [illegible] sweet- advantage [illegible] under purle [illegible] Malmsey [illegible] wine of [illegible] by age. [illegible] neriffe, but [illegible]

[illegible] coast of the [illegible] t in the de- [illegible] N. lat. and [illegible] ect line west [illegible] eux, Alençon,

[illegible] hood of this [illegible] is mentioned [illegible] ing continually [illegible] the eighth or [illegible] insula, on which [illegible] the name of the [illegible] town is indi- [illegible] by the Bretons [illegible] Malo was the seat

April, 1765. A collected edition of his poetical works was published by himself, in 3 vols. 8vo., in 1759.

MALLET, PIERRE HENRI, born at Geneva in 1730, became professor of belles-lettres at Copenhagen, where he wrote several works on the history and antiquities of Scandinavia. He was made member of the academy of Upsala, and became also correspondent of the Académie des Inscriptions of Paris. He afterwards returned to Geneva, and was appointed professor of history in the academy of that city. He died at an advanced age. His principal works are:—1, 'Introduction à l'Histoire du Danemarc,' Copenhagen, 1755; 2, 'Edda, ou Monumens de la Mythologie et de la Poesie des Celtes,' translated into English by Bishop Percy under the title of 'Northern Antiquities and the Edda,' 2 vols. 8vo., London, 1770; 3, 'De la Forme du Gouvernement de la Suède,' 1756; 4, 'Histoire du Danemarc,' 3 vols. 4to., 1777; 5, 'Histoire de la Maison de Hesse;' 6, 'Histoire de la Maison de Brunswick.'

Mallet must not be confounded with Mallet du Pan, also a Genevese writer (born in 1750), who was well known for the various journals which he edited in Paris and London, and especially for his 'Mercure Britannique,' 1798-99, which, owing to the ability of the conductor and the energy of its language, was one of the most powerful organs of the Anti-Gallican press of that time.

MA'LLEUS. [Malleacea.]

MALLORCA, or MAJORCA, the largest of the Balearic Islands, is situated in the Mediterranean, off the eastern coast of Spain, to which kingdom it belongs. It lies between 39° 20′ and 40° 5′ N. lat., and between 2° 20′ and 3° 20′ E. long., about 110 miles from the coast of Catalonia and 120 from that of Valencia. It is nearly 60 miles long from east to west, and in some parts 40 broad from north to south: its circuit is 143 miles, and its area about 1410 square miles. The general surface of the country is hilly. On the north-west side a mountain-range crosses the island, the highest summit of which, the Puiz de Torellas, is above 4500 feet high. Another range of lofty hills runs parallel to this, through the heart of the island, and high grounds in many parts border on the coast. The eastern and southern districts are the most level in character. Some of the plains are liable to be inundated by the periodical rains, on which account they are generally used as pasture-land. Near Campos on the south, and near Alcudia on the north of the island, are marshy tracts which generate malaria to a very pernicious extent. The general aspect of the country is extremely beautiful and picturesque. The roads in the interior are very rugged and stony, and are traversed only by mules, which form the ordinary mode of conveyance, and by carts of clumsy and primitive construction, similar to those of Spain.

The climate of Mallorca is delightful, the winters being mild, though occasionally stormy, and the heats of summer being tempered by the sea-breezes and the vicinity of the mountains. The extreme fertility of the soil is mentioned by Strabo. Firs, holm-oaks, and wild olives adorn the slopes, and often cover the summits of the higher mountains; lavender, rosemary, thyme, marjoram, saffron, and roses perfume the air; and the valleys and level tracts produce in abundance corn, wine, oil, and fruit. The date-palm and the plantain attain their full size, though seldom yielding fruit. The valley most famed for beauty and fertility is that of Soler, 11 or 12 miles in circumference, abounding in orchards of orange and lemon trees, and hemmed in by mountains luxuriantly clothed with wood. The island is poorly watered, for though there are said to be no less than 210 streams, only two deserve the name of rivers. The larger of these is the Rierra, which falls into the sea beneath the ramparts of Palma, the capital. It is almost dry in summer, but in the rainy season it is very full and impetuous, and on several occasions in past ages has carried away great part of the city, and drowned many thousands of the inhabitants.

Mallorca produces wheat, barley, and oats, wines of excellent quality, olive oil in large quantities, hops, vegetables; fruits, particularly melons, oranges, and citrons, all of superior flavour; honey, hemp, wool, and a little silk. Sheep, goats, horned cattle, and pigs are numerous; poultry and game are abundant. In 1820 the productions of this island were valued at 53,000,000 reales, or about 560,000*l.* With the exception of a few foxes and hawks, the island is free from beasts and birds of prey; nor are there many venomous reptiles.

The geology of Mallorca is but imperfectly known. Granite and porphyry are said to be found, but the generality of the rocks are of secondary or tertiary formation. There is slate, fine marble of various colours, with abundance of sandstone, freestone, and chalk. Seams of coal have been discovered, but have not been worked. Coral is found in the bay of Alcudia. Salt is procured by the evaporation of sea-water in the low grounds about Campos; and in the same district is a warm sulphureous spring, famed for its efficacy in removing cutaneous complaints.

The original colonists of Mallorca were, according to Strabo, Phœnicians. The island fell with Spain successively into the hands of the Carthaginians and Romans. After being taken by Metellus, surnamed Balearicus, B.C. 123, a colony of 3000 Romans from Spain was established in the island. In A.D. 426 it was seized by the Vandals. In A.D. 798 it was conquered by the Arabs; and after being several times taken by the Christians and retaken by the Mohammedans, it was finally wrested from the latter in 1229 by James, king of Aragon; and since the union of the crowns of Castille and Aragon, it has remained subject to Spain.

The population, though much decreased since the time of the Moors, is still about 140,000. Palma and Alcudia are the only cities.

Palma, the capital, which was one of the two principal towns in the time of Strabo, is on the south-east of the island, picturesquely situated on a slope in the bight of a deep bay, ten or twelve miles wide, and formed by the capes Blanco and Cala Figuera. The city, though walled and fortified, could not sustain a regular siege. Its population is about 33,000. The streets are in some parts narrow and mean, in others wide and regular; the houses are large and without external ornament, mostly in the Moorish style of architecture, and many are built of marble. Palma is the see of a bishop, who is a suffragan of Valencia. The cathedral, a large Gothic edifice of much simple beauty, was built in the beginning of the thirteenth century by James of Aragon, surnamed the Conqueror, who is interred within its walls. Attached to the cathedral is a spire, of such remarkable delicacy and airiness, that it has received the name of 'The Angel's Tower.' There are many other religious edifices in Palma, five parish churches and numerous convents (recently suppressed), together with several hospitals and two colleges. Ferdinand V. founded a university here in 1483. The other public buildings are:—the episcopal palace; the royal palace, a very antient edifice, the residence of the captain-general, or governor of the island, comprehending also an arsenal, a magazine, and a prison; the town-hall; and the house of contractation, or of mercantile assembly and judicature, a Gothic edifice of remarkable beauty, but now serving only as a memento of the decayed fortunes of the city. Palma, though in the thirteenth century one of the chief markets of Europe, has now comparatively but little commerce. Its port is small, and will only admit vessels of little draught. Within and without the city are to be seen numerous evidences of the superior size, population, and commercial importance of Palma in past ages.

Alcudia, the other city of Mallorca, is on the north-east coast, on a neck of land between the two bays of Alcudia and Pollenza. It stands on a rising ground, and is fortified with antient walls of great height. Some centuries ago it was a large and flourishing city, but is now in a wretched state of decay, with a population of only 1000 souls.

The other principal towns of Mallorca are:—Arta, with 8000 inhabitants; Manacor, with 7000 inhabitants; Pollenza (the Pollentia of Strabo), with 6000 inhabitants; Felanix, with 6000 inhabitants; Soler, Campos, Santani, San Marcial, Banalbufar, with 5000 inhabitants each; Andraig, with 4000 inhabitants; and Lluch Mayor, with 3500 inhabitants. There are other towns of smaller size, in all thirty-two in number. There are also numerous villages.

The manufactures of Mallorca are linen cloths (coarse and fine), silk stuffs, and woollen goods, as tapestry, blankets, sashes, and corded stuff. Of the leaves of the palm are made brooms and baskets. The exports are oils, vegetables, fruits (fresh and dried), wines, brandy, cheeses, and woollen goods. Most of these are taken by Spain; but some by Sardinia, Malta, England, Holland, France, and even America. The imports, which in value bear a very small proportion to the exports, are corn, salted provisions, sugar, coffee, spices, tobacco, rice, cutlery and other made goods, and articles of clothing.

In character the Mallorquines somewhat resemble the Catalans, but are less industrious and enterprising. They are much attached to their country, loyal to the government, and make excellent soldiers and sailors; they are bigoted and superstitious in religion, boastful, though mild and amiable in disposition, hospitable to strangers, and prepossessing in their manners. The women are elegant, and fond of dress and ornament. Castillian is spoken by the upper and middle classes, but the language of the lower orders is a mixed jargon of Castillian, Catalonian, and Arabic.

(Strabo, 167, *Casaub.*; Mariana, *Historia General de España*; Laborde, *Itinéraire Descriptif de l'Espagne*; Dameto and Mut, *History of the Balearic Kingdom*; St. Sauveur, *Travels through the Balearic and Pithiusian Islands.*)

MALLOW, the common name of the wild species of the genus Malva, the type of the natural order Malvaceæ. There are two common weeds of this genus, with flat, ribbed, mucilaginous fruits, enclosed in a valvate calyx, and not unlike a small round cheese, on which account they have in England the vulgar name of Cheeses, and in France of Fromageons. [MALVACEÆ.]

MALMAISON. [SEINE ET OISE.]

MALMESBURY. [WILTSHIRE.]

MALMESBURY, WILLIAM OF, one of the most valuable of our old historians, is said to have been born in Somersetshire, about 1095 or 1096: his father was a Norman, his mother an Englishwoman. When a boy he was placed in the monastery whence he derived his name, where, in due time, he became librarian, and, according to Leland, precentor, and ultimately refused the dignity of abbot. He is generally supposed to have died about 1143, though Sharpe, in his translation of Malmesbury's 'History of the Kings of England,' says it is probable that he survived this period some time, for his 'Modern History' terminates at the end of the year 1142; and it appears that he lived long enough after its publication to make many corrections, alterations, and insertions in that work, as well as in the other portions of his history. Some notion of his diligence may be afforded by the following list of his works:—1, 'De Gestis Regum' (the history of the kings of England). The first three books were probably written after 1120. After some delay he wrote the fourth and fifth books, which he dedicated to Robert, earl of Gloucester, at whose request he afterwards composed, 2, 'Historiæ Novellæ' (the modern history). This appears to have been begun after the death of Henry I. 3, 'De Gestis Pontificum' (the history of the prelates of England), containing, in four books, an account of the bishops and of the principal monasteries, from the conversion of the English by St. Austin to 1123, to which he added a fifth, *i.e.* 4, 'De Vita Aldhelmi,' completed in 1125. 5, 'De Vita Dunstani,' in two books, extant in the Bodleian Library, MS. Rawlinson, 263, written at the request of the monks of Glastonbury. 6, 'Vita S. Patricii,' in two books, quoted by Leland in his 'Collectanea,' tom. iii., p. 272, but of which no manuscript is at present known, any more than of, 7, 'Vita S. Benigni.' 8, 'Passio S. Indracti,' MS., Bodley, Digby, 112. 9, 'De Antiquitate Glastoniensis Ecclesiæ,' addressed to Henry, bishop of Winchester, and of course written after 1129. 10, 'Vita S. Wulstani, Episcopi Wigorniensis,' a translation from the Anglo-Saxon, the greater part of which is published by Wharton in his 'Anglia Sacra.' 11, 'Chronica,' in three books, supposed to be lost. 12, 'Miracula S. Elfgifæ,' in metre. 13, 'Itinerarium Joannis Abbatis Meldunensis versus Romam,' drawn up after 1140, a manuscript of which was formerly in the possession of Bale. 14, 'Expositio Threnorum Hieremiæ,' MS., Bodley, 868. 15, 'De Miraculis Divæ Mariæ libri quatuor,' noticed by Leland in his 'Collectanea,' tom. iv., p. 155. 16, 'De Serie Evangelistarum,' in verse. This also is mentioned by Leland (ibid., p. 157), but neither this nor the preceding work is at present known in our manuscript libraries. 17, 'De Miraculis B. Andreæ,' MS., Cotton, Nero E. i. 18, 'Abbreviatio Amalarii de Ecclesiasticis Officiis,' MS., Lambeth, 380. 19, 'Epitome Historiæ Aimonis Floriacensis,' MS., Bodley, Selden, Arch., B. 32. This work contains an extract from the 'Breviarium Alaricianum,' or Visigoth Code, made by the author with the object of giving a view of the Roman law. (Selden *Ad Fletam*, c. 7, § 2.) 20, 'De Dictis et Factis memorabilibus Philosophorum,' Harl. MS. 3969. Tanner ascribes one or two other pieces to him.

William of Malmesbury's greater historical works, 'De Gestis Regum,' 'Novellæ,' and 'De Gestis Pontificum,' were published by Sir Henry Savile among the 'Scriptores post Bedam,' fol. 1596, reprinted, fol., Francof., 1601. A translation of the 'De Gestis Regum,' into English, by the Rev. John Sharpe, was published in 4to., London, 1815. Gale printed Malmesbury's 'Antiquities of Glastonbury,' and Wharton, as already noticed, published his 'Life of St. Aldhelm.'

An excellent feature of Malmesbury's literary character is his love of truth. He repeatedly declares that for the remoter periods of his historical works he had observed the greatest caution in throwing all responsibility for the facts on the authors from whom he derived them; and as to his own times he declares that he has recorded nothing that he had not either personally witnessed or learned from the most credible authority.

(Leland, *De Script. Brit.*; Tanner, *Bibl. Brit. Hib.*, pp. 359-360; Nicolson's *English Histor. Lib.*, edit. 1776, pp. 47-84-88; J. A. Fabricii *Bibl. Lat. med. et inf. ætatis*, 4to., Patav., 1754, tom. iii., p. 152; Sharpe's *Pref.* to his translation of William of Malmesbury *De Gestis Regum.*)

MALMÖ, a town in Sweden, in the province of Skane and the political division of Malmölän, is situated about 55° 40′ N. lat. and near 13° E. long. It is built on the widest part of the Sound, nearly opposite the town of Copenhagen, on level ground, and has a good and safe harbour, protected by the fortress of Malmöhuus. The town is well built, and has regular streets. In the middle is a fine square, 166 yards long and 144 wide. The inhabitants, about 9000 in number, carry on an active commerce in corn, as Malmö is the principal commercial town of the fertile and rich province in which it is situated. It may also be counted among the manufacturing towns of Sweden, as there are several manufactories in which cloth, stockings, hats, gloves, carpets, soap, leather, starch, and looking-glasses are made. Some of these manufactories are rather extensive. It has a grammar-school and other schools for the poorer classes of society. (Forsell's *Statistik von Schweden.*)

MALMSEY, a luscious and high-flavoured wine made in the island of Madeira from grapes of a peculiar kind, which are suffered to attain the last stage of ripeness before they are gathered. Malmsley wine has much body, and will retain its good qualities for an indefinite period of time; in fact, it is improved materially by keeping The quantity made is small, much smaller indeed than the demand, to supply which the wine dealers are said to give factitious sweetness to common kinds of wine, which are then sold under the name of Malmsey. When newly made, Malmsey Madeira is of the same golden hue as the ordinary wine of the island, but its colour is materially deepened by age. Malmsey wine is also made in the island of Teneriffe, but the quality is greatly inferior to that of Madeira.

MALO, ST., a seaport in France, on the coast of the English Channel, capital of an arrondissement in the department of Ille et Vilaine. It is in 48° 38′ N. lat. and 2° 2′ W. long.; 194 miles from Paris in a direct line west by south, or 221 miles by the road through Dreux, Alençon, Mayenne, and Fougères.

A town called Aletum, in the neighbourhood of this place, existed in the time of the Romans, and is mentioned in the 'Notitia Imperii.' The inhabitants, being continually exposed to the attacks of pirates, retired, in the eighth or ninth century, to a neighbouring rocky peninsula, on which they founded a town called St. Malo, from the name of the then bishop of Aletum. The site of the old town is indicated by the name of a headland, called by the Bretons Guich Alet. Before the Revolution, St. Malo was the seat of a bishopric.

The town of St. Malo is on a rocky peninsula on the eastern side of the æstuary of the Rance, which opens into the roadstead of St. Malo. The peninsula is joined to the main by a causeway about 200 yards wide. A little distance to the south of St. Malo is the town of St. Servan, separated from St. Malo, to which in reality it forms a suburb, by the harbour, which is an inlet of the æstuary. St. Malo is surrounded by walls and bastions, and defended on the north-west side by a castle built by Anne, duchess of Bretagne, and in other parts by five forts. The more modern part of the town is regularly laid out, and the ramparts afford pleasant walks. The principal public buildings are the ex-cathedral, the former episcopal palace, the exchange, and the theatre. The harbour, situated between the town, the isthmus, and the mainland, is commodious and safe. Vessels are left dry at low water: the depth at high water is 45 feet. The entrance is difficult from its narrowness, and from its being, as well as the roadstead, beset with rocks and shoals. There are two ports or docks, one of them for the navy, at St. Servan.

The population of St. Malo in 1831 was 9701 for the town, or 9981 for the commune; that of St. Servan 7665 for the town, 9975 for the commune: together 17,366 for the towns, or 19,956 for the communes. In 1836 the population of the commune of St. Malo was 9744. The inhabitants manufacture cordage, fishing-nets, and other utensils for the fisheries. There are ship-building yards, and a government snuff manufactory. Trade is not so brisk as formerly, perhaps through the diminution of the English smuggling trade. Considerable business is however done in wine, brandy, snuff, salt provisions, hemp, and pitch; in linens, which are sent to Spain; and in the agricultural produce of the surrounding country. There are depôts of salt and of colonial produce. There is one yearly fair, which lasts eight days. Many vessels are fitted out for the Indies, and for the whale and cod fisheries; and the coasting trade is very active. The sailors of St. Malo are among the best in France. In war-time many privateers are fitted out, the activity of which has drawn upon the town several attacks by the English.

There are two churches in St. Malo, beside the ex-cathedral and those in St. Servan; a foundling and a general hospital, a high-school, a free school for navigation, a drawing-school, and an agricultural society. There is a naval arsenal.

Jacques Cartier, the discoverer of Canada; the seaman Duguay-Trouin; Maupertuis, and La Mettrie, a physician who died in exile for doubting the immortality of the soul, were natives of this town.

The arrondissement of St. Malo comprehends 60 communes, and is divided into nine cantons, or districts under a justice of the peace: its area is 367 square miles; the population in 1831 was 120,561; in 1836, 118,243. The cultivation of tobacco is extensively carried on, and would be much more so but for the government restrictions.

MALONE, EDMOND, was born at Dublin in 1741. His father was one of the judges of the Court of Common Pleas in Ireland; and the subject of this notice, having taken a degree in the university of Dublin, was called to the Irish bar in 1767. Mr. Malone was however devoted to literary pursuits; and an independent fortune having devolved upon him, he took up his residence in London, and became an intimate of the more eminent literary men of that day, including Burke and Johnson. He subsequently became distinguished, principally as an editor of Shakspere. His first publication, connected with this his favourite subject, was that of a Supplement to Steevens's edition of 1778, in 2 vols. This contains Shakspere's sonnets and other poems, with notes, and the various plays which, by general consent, have been rejected from his works—we mean 'Sir John Oldcastle,' 'Locrine,' &c. It also includes 'Pericles,' which has subsequently found a place in the variorum editions. Malone displayed in this work many qualities which in some degree fitted him to be an editor of Shakspere's undoubted works; and in 1790 he brought out an edition of his own. He had previously contributed some notes to Steevens's edition of 1785. There were essential differences of opinion between Steevens and Malone, which would have rendered their co-operation perhaps impossible. Steevens carried his disregard of the authority of the texts of the old editions to an extravagant length; Malone, on the contrary, had a proper deference for that authority. Steevens, especially, despised the text of the first folio; Malone, in a much greater degree, respected it: Steevens was coarse and even prurient in his editorial remarks; Malone was cautious and inoffensive: Steevens had the more acuteness; Malone the greater common sense. As it was, Malone published a rival edition, and Steevens quarrelled with him for ever. In Malone's edition, his History of the Stage was, for the time at which it was written, a remarkable performance; and his Essay on the Genuineness of the three Plays of Henry VI. displays great critical sagacity and discrimination. The same qualifications which he exercised as an editor of Shakspere were equally exhibited in the part which he took in the controversies as to the genuineness of the Rowley poems, and the Shaksperian papers published by the Irelands. He was amongst the first to proclaim his belief that the poems attributed to Rowley were the production of Chatterton; and the imposition of William Henry Ireland was very clearly pointed out by him in a letter addressed to Lord Charlemont. This tract contains many interesting researches into our earlier literature, and is worth referring to, amidst the mass of nonsense which this controversy called forth. Malone also published, in 1797, the posthumous edition of the works of Sir Joshua Reynolds, with a memoir, he being one of that eminent man's executors. The remainder of his life was spent in adding to his notes on Shakspere, and preparing for a new edition, which he did not live to complete. His death took place in 1812, when he was in his seventy-first year. His posthumous edition of Shakspere, very carefully edited, was published by his friend Mr. James Boswell, in 1821, in 21 vols. Of Malone it is not, perhaps, very high praise to say that he was without doubt the best of the commentators on Shakspere. He is, compared with his predecessors, more trustworthy in his assertions, more cautious in his opinions, and more careful to interpret what he found in the text than to substitute his own conjectures. But he belonged to an age when the merits of Shakspere were not properly appreciated; and he is, like the rest of his brethren, cold and captious. He was of a critical school which, to a great extent, is fortunately extinct.

MALOPE, a genus of Malvaceous plants, consisting of two species, one of which is commonly cultivated as a favourite hardy annual. This plant, Malope malacoides, is common in Barbary, where it is found among stones and rocks, which it ornaments with its large crimson flowers; it is also met with in Sardinia and other parts of the south of Europe. The genus differs from Malva in having its carpels distinct, and heaped irregularly over a central receptacle, instead of being placed in a whorl and consolidated. Three or perhaps four other species are known to botanists.

MALOUINES. [FALKLAND ISLANDS.]

MALPAS. [CHESHIRE.]

MALPIGHI, MARCELLUS, was born near Bologna, in 1628. He studied medicine in that university, and in 1653 received his doctor's degree. His chief instructor in anatomy was Massari, at whose house he tells us that he and a few other select students were accustomed to meet in private, to dissect and discuss the important discoveries of the day. In 1656 he was appointed professor of medicine at Bologna, but soon after resigned on being invited to a similar office in the university of Pisa. Here he formed an intimate acquaintance with Borelli, the professor of mathematics in the same institution, to whom he often expresses his gratitude for the kindness and instruction which he received from him, though he doubtless repaid no small part of his obligations in the assistance which he gave to the valuable treatise 'De Motu Animalium.' Declining health obliged Malpighi to return to Bologna, but in 1666 he went to Messina, where he held the professorship of medicine for four years. He then again resided near Bologna till 1691, when he was summoned to Rome, and appointed chief physician and chamberlain to Innocent XII. In 1694 he died of apoplexy.

Malpighi is now chiefly remembered in connection with his discoveries in the anatomy of the skin and of the secreting glands. He first described clearly the structure of the tongue, showing that it is at once a muscular and a sensitive organ; and he pointed out the fine papillæ on its surface as the seat of sensation. Imagining that he could perceive a structure in the skin analogous to that of the surface of the tongue, he examined the former tissue in several animals, and at length succeeded in demonstrating that it is everywhere beset with delicate conical papillæ, the chief organs of the touch. In the coloured portion of the tongue of the ox he had first discovered the rete mucosum, or, as it is often called in his honour, rete Malpighii; and he afterwards showed a similar membrane on the skin of the negro. He proved, as Riolan had before done, that the colour of the skin depends on this substance, the cutis of white and of coloured races being always of the same rosy hue. [SKIN.]

On the subject of the structure of secreting glands, Malpighi was long engaged in a discussion with Ruysch, maintaining that all glands consisted of ducts terminating in te sacculi, on which blood-vessels ramified without ig any open communication with them; while Ruysch that the blood-vessels were continued directly and with orifices into the ducts of the glands. The point was debated when Müller's late work, 'De Glandularum turâ,' proved that Malpighi, though incorrect in some ls, was perfectly correct in the general view which he aken of this structure. [GLAND.]

lpighi was the first who examined the circulation with icroscope. He published also some excellent obser- as on the chemical and other characters of the blood; his works on the process of incubation, and on the ture and physiology of plants, though now almost for- n, must have been very important additions to the ledge of his day.

veral editions were published both of his separate ses and of his complete works: the titles of the most tant are, 'Anatomes Plantarum Idea'—'De Bom- —'De Formatione Pulli in Ovo'—'De Cerebro'—'De iâ'—'De externo Tactûs Organo'—'De Omento'— tructurâ Viscerum'—'De Pulmonibus'—'De Structurâ lularum Conglobatarum.' The 'Opera Posthuma' were l by Petrus Regis of Montpellier; they consist chiefly istory of his discoveries and controversies, with which interwoven his own biography. Several of Malpighi's vorks were addressed to the Royal Society of London, ich he was elected an honorary member in 1688, and fterwards a constant correspondent.

LPIGHIA'CEÆ, a natural order of exogenous , with polypetalous flowers, trigynous pistils, usually lelphous stamens, and alternate exstipulate leaves, iting various parts of the tropics. They are usually s or trees, and but seldom herbaceous plants. In on to the more general characters already mentioned, have in a majority of cases a pair of convex oval s on the face of each sepal, and in many species the are attached to the leaves, &c. by the middle; so that of that description have acquired the name of *Malaceous*. Many of them are beautiful objects, especially the Galphimias and climbing species of Hiræa and Banisteria; a few only are useful. The bark of Malpighia Mou reila and crassifolia is a kind of febrifuge. The fruit of Malpighia glabra is the Barbadoes Cherry of the West Indies: it varies in size, from that of a large pea to a small cherry, is smooth, shining, and has three triangular stones; its flesh is juicy and sweet, but insipid. The fruit of Byrsonima coriacea, or Lotus-berry of the West Indies, is of much better quality; it is yellow, and contains a single stone. A few kinds produce timber of a bright yellow colour.

Malpighia macrophylla.

entire flower, much magnified; 2, the stamens and pistils; 3, a transection of the ripe fruit.

The order is nearly related to the Aceraceæ, or Sycamores of colder climates, differing in little except the ternary division of the fruit, the symmetrical flowers with unguiculate petals, and the pendulous or suspended seeds.

MALPLAQUET. [MARLBOROUGH, DUKE OF.]

MALT is grain, usually barley, which has become sweet and more soluble in water from the conversion of its starch into sugar by artificial germination to a certain extent, after which the process is stopped by the application of heat.

For the following short sketch of the process, which is called *malting*, we are chiefly indebted to a valuable work on 'Vegetable Chemistry,' recently published by Dr. Thomson, of Glasgow.

The barley is steeped in cold water for a period which (as regulated by law) must not be less than 40 hours; but beyond that period the steeping may be continued as long as it is thought proper. Here it imbibes moisture, and increases in bulk; at the same time a quantity of carbonic acid is emitted, and a part of the substance of the barley is dissolved by the steep-water. The proportion of water imbibed depends partly upon the barley, and partly on the length of time that it is steeped. From the average of a good many trials, it appears that the medium increase of weight from steeping may be reckoned 0·47; that is to say, every 100 pounds of barley when taken out of the steep weigh 147 pounds. The average increase of bulk is about a fifth; that is to say, 100 bushels of grain, after being steeped, swell to the bulk of 120 bushels. The carbonic acid emitted while the barley is in the steep is inconsiderable; and it is probable, from the experiments of Saussure, that it owes its formation, at least in part, to the oxygen held in solution by the steep-water.

The steep-water gradually acquires a yellow colour, and the peculiar smell and taste of water in which straw has been steeped. The quantity of matter which it holds in solution varies from $\frac{1}{50}$th to $\frac{1}{100}$th of the weight of barley. It consists chiefly of an extractive matter of a yellow colour and disagreeable bitter taste, which deliquesces in a moist atmosphere, and always contains a portion of nitrate of soda. It holds in solution most of the carbonic acid disengaged. This extractive matter is obviously derived from the husk of the barley, and is that substance to which the barley owes its colour. Accordingly grain becomes much paler by steeping.

After the grain has remained a sufficient time in the steep, the water is drained off, and the barley thrown out of the cistern upon the malt-floor, where it is formed into a heap called the *couch*, about 16 inches deep. In this situation it is allowed to remain about 26 hours. It is then turned by means of wooden shovels, and diminished a little in depth. This turning is repeated twice a day or oftener, and the grain is spread thinner and thinner, till at last its depth does not exceed a few inches.

When placed in a couch, it begins gradually to absorb oxygen from the atmosphere, and to convert it into carbonic acid, at first very slowly, but afterwards more rapidly. The temperature, at first the same with that of the external air, begins slowly to increase; and in about 96 hours the grain is at an average about 10° hotter than the surrounding atmosphere. At this time the grain, which had become dry on the surface, becomes again so moist that it will wet the hand, and exhales at the same time an agreeable odour, not unlike that of apples. The appearance of this moisture is called *sweating*. A small portion of alcohol appears to be volatilized at this period. The great object of the maltman is to keep the temperature from becoming excessive, which is effected by frequent turning. The temperature which it is wished to preserve varies from 55° to 62°, according to the different modes of malting pursued.

At the time of the sweating, the roots of the grains begin to appear, at first like a small white prominence at the bottom of each seed, which soon divides itself into three rootlets, and increases in length with very great rapidity, unless checked by turning the malt. About a day after the sprouting of the roots, the rudiments of the future stem, called *acrospire* by the maltsters, may be seen to lengthen. It rises from the same extremity of the seed with the root, and advancing within the husk, at last issues from the opposite end; but the process of malting is stopped before it has made such progress.

As the acrospire shoots along the grain, the appearance of the kernel, or mealy part of the corn, undergoes a considerable change. The glutinous and mucilaginous matter is taken up and removed, the colour becomes white, and the texture so loose that it crumbles to powder between the fingers. The object of malting is to produce this change: when it is accomplished, which takes place when the acrospire has come near to the end of the seed, the process is stopped by drying the malt upon the kiln. The temperature at first does not exceed 90°; but it is raised very slowly up to 140° or higher, according to circumstances. The malt is then cleared, to separate the rootlets, which are considered injurious.

Barley, by being converted into malt, generally increases two or three per cent. in bulk; and loses, at an average, about 20 per cent. in weight, of which 12 are ascribed to kiln-drying, and consist of water, which the barley would have lost had it been exposed to the same temperature; so that the real loss does not exceed 8 per cent. From many trials, made with as much attention to all the circumstances as possible, Dr. Thomson considers the following to be the way of accounting for this loss:—

Carried off by the steep-water .	1·5
Dissipated on the floor . .	3·0
Roots, separated by clearing .	3·0
Waste	0·5
	8·0

The loss on the floor ought, in Dr. Thomson's opinion, to be entirely owing to the separation of carbon by the oxygen of the atmosphere; but were this the only cause, it would be much smaller than three per cent., according to the same authority. Two other causes concur to produce this loss:—1. Many of the roots are broken off during the turning of the malt; these wither and are lost, while others grow in their place. 2. A certain portion of the seeds lose the power of germinating, by bruises and other accidents, and these lose a much greater portion than three per cent. of their real weight. After numerous careful trials, Dr. Thomson is disposed to conclude that the quantity of carbon separated during the whole process of malting, by the formation of carbonic acid gas, does not exceed two per cent., and that the weight of the roots formed amounts often to four per cent. These two, in reality, include the whole loss of weight which barley sustains when malted. What is lost in the steep, being husk, need scarcely be reckoned.

In the opinion of Dr. Thomson, the roots appear, from the process, to be formed chiefly from the mucilaginous and glutinous parts of the kernel. The starch is not employed in their formation, but undergoes a change, intended, no doubt, to fit it for the future nourishment of the plumule. It acquires a sweetish taste, and the property of forming a transparent solution with hot water. In short, it approaches somewhat to the nature of sugar, and is probably the same with the sugar into which starch is converted by boiling it with diluted sulphuric acid.

The following are the results of Dr. Thomson's analysis of barley and the malt made from it:—

	Barley.	Malt.
Gluten . .	3	1
Sugar . .	4	16
Gum . .	5	14
Starch . .	88	69
	100	100

In brewing ale, porter, and table-beer, three different kinds of malt are employed, which are known as pale and amber malts, brown or blown malt, and roasted or black malt, sometimes called patent malt. The pale or amber malt yields the saccharine or fermentable extract; the brown malt is not fermentable, but is employed to impart flavour; and the roasted malt is employed, instead of burnt sugar, merely to give colouring matter to porter.

The analysis of malt above stated is that of pale malt, whilst in the brown and roasted malts the sugar appears to be entirely converted into gum and colouring and extractive matters; and hence they are incapable of undergoing fermentation. The brown malt is subjected to a higher temperature in drying than the pale malt, and by a still further exposure to heat in revolving cylinders or roasters it is converted into black or patent malt.

Statistics.—Malt was first made to contribute to the public revenue in England in 1697. In Scotland the duty commenced in 1713, and in Ireland in 1785. The rate of duty, calculated on the imperial quarter, was in England 6$\frac{16}{21}$*d.* per bushel from 1697 to 1760; from the latter year to 1780 the duty was 9½-$\frac{3}{21}$*d.* per bushel; from 1780 to 1791 the duty was 1*s.* 4½*d.*; it was then for a short time raised to 1*s.* 7½*d.*, but was lowered to 1*s.* 4½*d.* again in 1793, and so continued till 1802, when it was raised to 2*s.* 5*d.*, and in the following year was further raised to 4*s.* 5¾*d.*, and so continued till 1816, when it was reduced to 2*s.* 5*d.* In 1819 the duty was advanced to 3*s.* 7½*d.*; in 1822 it was reduced to 2*s.* 7*d.*, and has continued at that rate until this time. In Scotland the duty from 1713 to 1726 was 6$\frac{16}{21}$*d.* per bushel; in 1726 it was reduced to one-half that rate until 1760; in 1780 it was again advanced to 8½*d.*, and in 1803 to 11*d.*. In 1804 a distinction was made in the duty, according as the malt was made from barley or from bere or bigg, and thenceforward the rates have been as follows:—

		From Barley.		From Bere or Bigg.	
		s.	*d.*	*s.*	*d.*
1804	.	3	9½	3	1½
1816	.	1	8½	1	8½
1819	.	3	7½	3	7½
1820	.	3	7½	3	1
1821	.	3	7½	2	10
1822	.	2	7	2	0

There has not been any alteration since 1822.

In Ireland the duty first charged in 1785 was 7*d.* per bushel; in 1794 the rate was advanced to 9½*d.*, and in the following year to 1*s.* 3*d.*; in 1798 to 1*s.* 5*d.*, and in 1799 to 1*s.* 6½*d.* Further additions were made in 1803 to 1*s.* 9½*d.*, in 1804 to 2*s.* 3½*d.*, in 1806 to 2*s.* 6½*d.*, in 1813 to 3*s.* 3½*d.*, and in 1815 to 4*s.* 5*d.* A reduction took place in 1816 to 2*s.* 4½*d.*; in 1826 the duty was again raised to 3*s.* 6½*d.*, and was again reduced in 1822 to 2*s.* 7*d.* The only alteration since was made in 1830, when the duty on malt from bigg was reduced to 2*s.* per bushel.

The quantity of Malt charged with duty in various years in the different divisions of the kingdom, and the amount of revenue received thereon, have been as follows:—

Years.	ENGLAND. Bushels.	SCOTLAND. Bushels.	IRELAND. Bushels.	Total. Bushels.	Duty. £
1703	26,754,505	..	..	26,754,505	691,577
1710	19,671,021	..	..	19,671,021	511,864
1720	25,625,844	..	..	25,625,844	665,327
1730	28,410,421	..	..	28,410,421	736,315
1740	22,074,674	..	..	22,074,674	573,485
1750	29,284,786	..	..	29,284,786	758,378
1760	27,810,971	..	..	27,810,971	599,819
1770	24,452,960	1,762,460	..	26,215,420	991,385
1780	30,805,100	2,215,487	..	33,020,587	1,579,603
1790	21,976,959	1,544,666	4,607,953	28,129,578	1,675,671
1800	14,049,749	876,598	681,340	15,607,687	1,032,867
1810	23,546,346	820,294	2,522,543	26,889,183	5,731,993
1820	23,884,242	1,182,208	1,793,671	26,860,121	5,096,195
1821	26,138,437	1,305,659	1,949,315	29,393,411	5,360,775
1822	26,688,512	1,403,177	1,756,391	29,848,080	3,915,661
1823	24,845,152	1,616,590	1,702,395	28,164,137	3,251,334
1824	27,615,383	2,788,608	2,107,752	32,511,743	3,999,429
1825	29,572,741	3,925,847	2,706,862	36,205,450	4,384,163
1826	27,335,971	2,726,555	2,406,252	32,468,778	3,955,935
1827	25,096,337	2,714,073	1,803,091	29,613,501	3,601,093
1828	30,517,819	3,867,159	2,409,228	36,794,206	4,623,113
1829	23,428,135	3,712,963	2,012,079	29,153,177	3,814,385
1830	26,900,902	4,101,946	1,959,606	32,962,454	3,436,271
1831	32,963,470	4,186,955	2,101,844	39,252,269	4,359,333
1832	31,669,771	3,714,334	2,006,350	37,390,455	4,825,130
1833	33,789,010	4,302,036	1,984,849	40,075,895	4,923,074
1834	34,449,646	4,491,292	2,204,658	41,145,596	5,275,665
1835	36,078,856	4,459,553	2,353,645	42,892,054	5,499,880
1836	37,196,997	4,903,187	2,287,535	44,387,719	5,699,879
1837	33,692,356	4,583,446	2,275,347	40,551,149	5,216,967
1838	33,823,985	4,419,141	2,262,440	40,505,566	4,932,080

It cannot fail to be observed, from these figures, that the increased consumption of malt in this country has borne a very inadequate proportion to the increase of the population. In the year 1730 the population of England and

Wales was 5,687,993, and it will be seen that the number of bushels of malt made for their use was within a very minute fraction of five bushels for each. In 1831 the numbers were 13,894,574, and the consumption of malt 32,963,470, being less than 2½ bushels for each. The reason for this comparative falling off is to be sought in our fiscal regulations. The rate of the duty was, in 1730, only one-fifth of the rate paid in 1831; and this alone would of course tend to check the consumption; but coincidently with this cause the importation of foreign-made malt has been prohibited; and as all the land in England fitted for the production of fine barley, such as is suited for the maltster, has long since been so applied, the consumption has been by that means starved, and the price enhanced so as to come in aggravation of the high duty. The importation of barley from foreign countries is allowed under very high duties, fluctuating with the price of home produce; but under no state of the market can any addition be thus made to the quantity of malt in this country, because barley which has undergone a voyage of any length is unsuited to the process of malting.

MALTA.—*General Description.*—The Maltese islands, in the Mediterranean, lie between 35° 49′ and 36° N. lat., and 14° 10′ and 14° 36′ E. long. from Greenwich. Malta is 58 miles from the nearest point of Sicily, and 179 from Cape Demas, the nearest point of the mainland of Africa. Its greatest length is 17½ miles, its greatest breadth is 9½ miles, and its circuit, as a boat would sail round it, 44 miles. It contains two principal ports on the south-east side of the island, which are separated by a tongue of land a mile and a half long, on which are built the castle of St. Elmo and a light-house, commanding the entrance to both ports. This tongue of land (formerly called Mount Sceberras) is 200 feet above the level of the sea, but lowers towards the point, and is almost flat at the part where it joins the mainland. On this advantageous position is built the modern city of Valletta, which is the seat of government, and the citadel of the island. It is defended on all sides by the most stupendous fortifications, which no power commanding less abundant resources than the Knights of St. John of Jerusalem, who drew large revenues and sometimes contributions from the richest countries of Europe, almost for this express purpose, could have constructed. Other works situate on the opposite side of the great harbour are of nearly equal strength; amongst which is the powerful castle of St. Angelo, that rakes the entrance of the harbour, with four tiers of guns, the heaviest of which is *à fleur d'eau*, corresponding to these, and completely forbidding every approach. Altogether the place is considered impregnable, which was proved by the fruitless endeavours of the British to expel the French garrison in 1798-1800.

When the British troops took possession of the place, after the capitulation of 1800, there were upwards of 800 pieces of ordnance mounted on the fortifications. The land-front of Valletta is defended by a strong line of works, which stretch across from one port to the other, having within them two very high cavaliers, which command the town and country, and look into the works on the opposite sides of each harbour. This front is strengthened by a dry ditch running its whole length, excavated in the rock to a depth varying from 90 to 140 feet. Outside the works of Valletta there is a suburb called Florian, and beyond this is another series of fortifications, consisting of an interior and exterior line and a horn and crown-work in front of them. The total number of embrasures in the defences of Valletta and its ports, including the three cities, is 947; but as the cavaliers and some of the parapets are *en barbette*, it may be calculated that the number of guns required to mount these works completely would be 1150. Many however are kept in store, and the embrasures at some points are considered useless.

The great harbour, which is to the eastward of Valletta, is about 3400 yards in length, with an entrance 450 yards wide, defended by a strong fort opposite the castle of St. Elmo, called Ricasoli, which crosses its fire, but is commanded by that castle. The harbour varies in width, from 700 to 450 yards, without including three coves or inlets, which are of themselves ports and capable of containing many ships of war. In one of these is situate the naval arsenal, consisting of a rope-walk, the offices of the naval departments and extensive storehouses, which would contain all that is necessary for the fitting out of a very large fleet. On the opposite side of the same cove are handsome residences for the superintendent and officers of the arsenal, and spacious stores for the victualling department. Here also are three immense arches of masonry, under which the galleys of the Order were built, and drawn up for repair and for protection from the weather. All these buildings were constructed by the Order, and they have been greatly improved by the British government. On a prominent point opposite Valletta, called Bighi, stands the new naval hospital, which was built by a vote of parliament in 1830, and is one of the many striking objects which surround this beautiful harbour. The entrance of the port has no bar or other impediment, and the water is so deep that the largest ships can sail in, close under the bastions of Valletta, direct to their anchorage. In the great harbour and its coves five and twenty sail of the line have been known to lie during the last war without inconvenience, besides three or four hundred merchantmen. The only wind which renders it dangerous for boats to ply, or creates any uneasiness for the shipping, is the north-east (commonly called *gregale*), and that only when it blows hard; but there is good holding ground, and accidents seldom happen.

The harbour to the westward, which is called Marsamuscetto (a word signifying, in Arabic, 'a place of shelter'), has at its entrance, opposite to and besides the castle of St. Elmo, a small but powerful fort called Fort Tigné. It is principally appropriated to vessels arriving from the Levant or countries infected with the plague, and it is therefore commonly called the Quarantine harbour. Here is also the lazzaretto, a suite of extensive buildings, built on an island in the centre of the harbour, with which have lately been united the spacious apartments of the square fort called Fort Manoel, on the same island; the whole forming the most complete quarantine establishment in the Mediterranean. In addition to its former accommodations a new plague hospital is now nearly finished. Since the plague of 1813-14 no case of plague has occurred in the island, though many infected ships and crews have been received in this lazzaretto.

Besides the harbours already mentioned there are several bays which ships sometimes enter in stress of weather, such as Marsa Scirocco, St. Thomas's Bay, and Marsa Scala, to the south-eastward of Valletta, and St. Julian's, St. Paul's, and Melleha, to the north-westward, on the shores of which, as well as on all parts of the island where a landing could be effected, small towers are erected, which under former governments served to give alarm in case of the appearance of an enemy, but are now only used to prevent smuggling and maintain the quarantine laws.

The whole of the southern coast of the island is by nature inaccessible. The rocks rise perpendicularly from the sea to the height of several hundred feet. The island slopes from the southern to the northern side.

The small islands of Gozo, Comino, and Filfla belong to the group of the Maltese islands. The island of Gozo is about three miles and a half north-west of Malta. It is of an oval form, ten miles long by five and a half in breadth; it has no town or port on its coasts, and is only approachable by small craft. Its coasts are perpendicular on all sides, and it is studded with a few points of high land in the form of cones, one of which, being about 570 feet high, serves as a landmark to vessels coming from the westward. Between Malta and Gozo stands the little uninhabited island of Comino, in the channel between the two islands, which has a depth of water sufficient for the largest ships. This island is two miles long by one mile wide. Another small island called Filfla, one mile and three-quarters south of Malta, is about a mile long and half a mile wide; it is a high perpendicular rock, also without inhabitants.

The general appearance of Malta and Gozo at sea is that of flat lands, the highest part of which is less than 600 feet above the level of the sea, and not visible at a greater distance than 24 miles. From being entirely calcareous rock, without any trees of large size, and a part of the year without any verdure whatever, the aspect of these islands is dreary and barren.

Particular Description.—The scene on entering the port of Malta is one of the most striking and beautiful that can be conceived. This magnificent harbour is surrounded with bastions, over which appear handsome buildings and the towers of numerous churches, all built of stone, and in abundance: some of the carrob-trees are a s old, and annually produce a plentiful crop.

—There are no wild animals in the island, and, rcity of pasture, very few cattle are bred. Meat ly imported from Barbary. Horses are also im- some mules are reared, and the asses of Malta have always been celebrated for their strength ; they fetch large sums for exportation. Goats bred, which are prized for the quantity of milk An animal once peculiar to Malta is the small long silken coat, mentioned by Pliny, which 'bichon;' but this race of dogs is now extinct. us reptiles are known. As fish forms a large the food of the inhabitants, the markets are well ith the common kinds. The dory, rock-cod, ed mullet, and a species of whiting, commonly are however generally to be had, and are ex- The cray-fish, found on the rocks of the island of of enormous size and fine flavour.

and Appearance of the Country.—The roads in Gozo, generally speaking, are good, and commu- ls all parts of each island: those branching off tta have received great attention from the present Sir Henry Bouverie.

and modes of transport are by single-horse carts, mules, or asses of burden. The calesse of Malta outh-looking vehicle, slung upon a clumsy pair of d shafts, and is made to carry four persons, but rawn by one horse, by the side of which the driver The glare of the hard naked roads, without hedges out trees, is injurious to the eyes under a bright The verdure being very partial either in extent too, the eye rests upon the innumerable stone lls, which are built up with the utmost care to the precious earth from being washed away by the nd these are only relieved here and there by the dark tint of the carrob-tree, which is always green; onally by the cactus, or Indian fig, which grows in ble abundance.

te.—Although these islands cannot boast of rich e, they are blessed with the steadiest climate in If the shade of trees be wanting, the inha- are free from the damp and stagnant air which woody countries; and the barrenness of the rock is nsated by the absence of vegetable putrefaction. the height of summer the heat is sometimes very sive; but the houses are spacious and well-built of particularly in the capital. Valletta is superior in spect to any town on the continent. For the greater f the year the atmosphere is so clear that it gives y and life to every object. The summit of Mount may often be distinctly seen at sunrise or sunset, al- it is 128 miles distant. The morning and evening also most gorgeous and beautiful. But upon the t of climate we shall rely upon Dr. Hennen (*Medical raphy of the Mediterranean*), who lived many years lta, and whose observations are confirmed by those ave long resided there. Much has been said, he s, on the climate of Malta: by some it has been re- ted as the hottest on earth; by others, as so dry as to solutely without fogs or dews; while others again er it as more variable than the climate of England. this great diversity of opinion however, it is almost sally admitted to be remarkably healthy. On re- e to tables kept for the last six years, it appears that eat indicated by the thermometer within doors has maximum 90°, minimum 46°, medium 63°. Every n accustomed to thermometrical observations is aware e difference between sensible heat and that indicated struments. In Malta it is peculiarly striking, and y depends on the state of the winds; but it is in the season that the heat is most oppressive, so much so justify the term 'implacable,' which is often applied The sun in summer remains so long above the ho- and the stone walls absorb such an enormous quan- f heat, that they never have a sufficient time allowed to get cool; and during the short nights this heat tes from them so copiously as to render the nights t as the days, and much more oppressive to the feel- of those who are accustomed to associate the idea of ess with darkness. 'I have seen the thermometer (says Hennen) in a very sheltered part of my house steadily tain during the night the same height to which it had risen in the day, while I marked it with feelings of increased oppression, and this for nearly three successive weeks of August and September, 1822.' No regular sea or land breezes are felt at Malta. As soon as the sun sinks beneath the horizon, the atmosphere becomes close and sultry, and whatever little breeze may have prevailed throughout the day dies away at once. Rain falls with tropical violence in the months of December, January, and part of February. The first indications of rain ordinarily appear about the end of August or the beginning of September. There are then three, four, or more days of brisk showers, with intermediate sunshine. October and the early part of November are delightful; the air is by that time sensibly cooled, and it is occasionally refreshed by showers. This season is denominated St. Martin's, or the little summer. December, January, and February are the rainy winter months, not however without the frequent recurrence of fine days. About March the sky gets settled. An occasional shower may fall in April and May; but during the months of June, July, and August scarcely a cloud is to be seen in the atmosphere. Unlike tropical climates, the rainy season of Malta is not peculiarly unhealthy, which may be in some measure attributed to the fact that the most copious rains fall principally during the night; and so absorbent is the soil in the country, and so well paved and drained are the streets in the city, that the rain is carried off from the surface almost as soon as it falls.

With regard to the winds, the only one which is deleterious is that called the *sciroeco* of the Mediterranean; and all winds blowing between the south and east are of this character. In Malta they are most prevalent in the end of August and in all September; or if they blow in other less sultry months, their effects are not so oppressive. Persons who have felt them but slightly on their first arrival have been not the less sensible to them after some time, and feel a languor and disposition to perspire with the slightest exertion. Dr. Benza, speaking of the sciroeco as felt in Sicily, gives a correct list of the sensations it causes: a general lassitude or torpor of the muscular system, attended by heaviness and oppression of the nervous system, inducing an inaptitude to any exercise, either corporal or mental; everything is damp and clammy to the touch, particularly one's clothes, which feel as if they had been dipped in water; the appetite is impaired, the thirst increased, the perspiration profuse; in short, one feels as if all the pores (as the common expression is) of one's frame were relaxed and open. All persons of weak constitution suffer considerably under the influence of this wind, and should avoid Malta in the month of September. But the winter of Malta is very delightful. The rain rarely continues for many days together; and although the air is sometimes penetrating, it is very common to enjoy clear weather and a cloudless sky. Frost and snow are unknown. Throughout the spring, northerly and westerly winds refresh the atmosphere; and it is not until the month of July that the inconveniences before described begin to be felt. Malta is eminently fitted for the residence of English invalids during the winter, *i.e.* from the beginning of October to the end of May. Englishmen may here find English society, reading-rooms newspapers, &c., and English medical advice. The houses are excellent; living is good and cheap; and the communication with England is speedy and regular. Malta has always been free from earthquakes. It may be remarked that hydrophobia is unknown in Malta; and that horses are never subject to the glanders, or to the disease called grease, so destructive to them in other countries; which may be owing to the dryness of the climate.

Character of the People.—The natives of Malta are a dark-skinned athletic race, and on that account, and from their Arabic dialect, have often been considered of African origin; but we look in vain for the Arab features. They are hardy and robust. The men are about the middle height, erect in stature, well formed, and active. The women are in general below the middle standard, but they are well made and graceful, have regular features and delicate limbs, and many of them are handsome; their complexion is usually dark. Deformity is exceedingly rare, and the general hale appearance of the population is an evidence of the salubrity of the climate. The Maltese marry very early: instances are not uncommon where girls have been mothers at fifteen. The women are very prolific; and where there are so few resources for the employment of families, there must be much poverty and wretchedness;

but the people are industrious, temperate, and frugal, and, being favoured by the climate, their wants are few. The great bulk of the people, who are not employed in field-labour, are stone-cutters. The Maltese are also excellent seamen, and are esteemed such in all the ports of the Mediterranean. In Valletta, since the connection with the English, all articles of household furniture are made in a superior manner, and much furniture is exported to the Levant. Workmen and artisans of all descriptions are numerous and expert in their respective trades. Their carvings in stone and many other works attest an eye and hand capable of great excellence in art. The elegance and beauty of their filagree work in gold and silver are well known. The higher orders enter into all the amusements common to persons of a similar rank in other parts of Europe; but gambling, drunkenness, and intrigue are almost unknown amongst them. They are fond of mixing in English society, and follow its usages: their manners, if not easy, are singularly exempt from vulgarity, and they have a great aptitude in catching those customs which are considered as the marks of good society. The men are generally good men of business, and the women good housewives. The grand-masters, as sovereign princes, granted to many Maltese the titles of marquis, count, or baron, in order to secure in their interests the antient families of the island, and also as a counterpoise to the importance of those who had in a similar manner been raised to nobility by the previous sovereigns. By the law of primogeniture their descendants still form a class of nobility, the property of a few individuals of which amounts to more than 1000*l.* a year, but an income of three or four hundred a year constitutes what is called a rich man. The younger branches sometimes study for one of the liberal professions, the candidates for which are numerous in Malta. All classes are much attached to the British government, and it would be difficult for any other power to seduce them from their allegiance.

Language.—The Italian language was introduced into these islands during the existence of the Sicilian government, and has ever since been in use, chiefly among the upper, but partly also among the middle classes of the inhabitants of the towns, in addition to their native tongue. The Italian has also been generally used in conducting the affairs of government, in legal proceedings generally, ecclesiastical matters, the transaction of commercial business, and for the purposes of education and literature. But up to the present time, the mother-tongue of the people, the Maltese, has continued in use throughout the country and at Gozo, and also among the poorer classes in the towns. It continues to be chiefly used by the upper classes in familiar conversation.

There has been much discussion on the language spoken by the Maltese, and as it is an unwritten language, the subject is one of some difficulty. But Mr. Schlienz, an oriental scholar, and a person who, by a residence of many years in Malta, is entitled to full confidence, has examined the arguments of those who attempt to trace it to the Phœnicians, the Carthaginians, and other antient nations, and comes to the conclusion 'that all its words, with the exception of very few, are purely Arabic, and conform in every respect to the rules, nay even to the anomalies, of the Arabic grammar.' A Maltese finds no difficulty in making himself understood anywhere on the Mediterranean coasts of Africa and Asia, a circumstance which is of no small importance in commercial intercourse, and which might be improved by a systematic cultivation of the Arabic language in Malta, to the great advantage of the Maltese people. The Arabic language was introduced into Malta by the Saracens, who had long had almost exclusive occupation of the island, when it was reduced by Count Roger the Norman.

The English language has made considerable progress in Malta; but it is still a foreign language to most of the natives. Many educated persons speak and write it, and still more read it, with facility. Among the inferior classes in the city, a slight smattering of English, for the purposes of trade, is very common.

Education.—The education of the Maltese has been until lately very limited, although a university, established in the time of the grand-master Pinto, offered to the natives the means of a learned and scientific education, and several erudite works have been written by Maltese authors. Since the Report of the Commissioners of Inquiry in 1838, the s of education have been more widely diffused; the government having, with a view to raise the population from their state of gross ignorance, undertaken the establishment of primary schools throughout the rural districts. Of these there are already twelve open (including Gozo), at which upwards of 1800 children of both sexes receive instruction. In Valletta and the three cities there are three schools, in which 600 children are educated. These schools are conducted upon the Lancasterian plan somewhat modified. The university has been also reorganized upon a more liberal scale, and has about 100 students. The Lyceum or high-school, attached to the university, is increasing in the number of scholars, which amount to 150. Education is therefore advancing in these islands, and will no doubt continue to do so, in proportion as the people become more aware of the advantages which they are likely to derive from it.

Religion.—The religion of the people is the Roman Catholic, to which they are universally and strongly attached, and they are punctually scrupulous in the observances of its ritual. Their religion was secured to them at the surrender of the island to the French republic, and again by the promises of the English generals who took possession of Malta, when the French were driven out of it. This promise has been scrupulously performed, and although the government has been Protestant for thirty-eight years, no religious dissension has been known to disturb the peace of society. The church festivals, which are very numerous, were always celebrated by public processions, which afforded an opportunity to the people of all classes to make holiday; and the women in particular, whom the customs and prejudices of former days kept in strict seclusion, except when they went to church, on these occasions found recreation in the public promenades, for which such festivals served as a pretext. The observances of religion were therefore connected with social life. But in proportion as Protestants and Catholics are becoming more mixed together in the forms of modern society, these festivals and ceremonies are less thought of, and in fact are gradually diminishing in importance. Both parties observe a moderation and deference for each other's opinions in religious matters; and Malta thus exhibits a striking and almost solitary instance of a highly religious people, ruled by a government of a different creed, by whose tolerance all live in the greatest harmony.

The Roman Catholic clergy are very numerous, amounting, between regulars and seculars, to about one thousand, some of whom are eminent for learning. The landed property of the church is about one-fourth of the rental of the island, out of which the bishop enjoys an income limited to 3000*l.* a year.

The Protestant places of worship are few and unassuming. The governor has his chapel in the palace of government; the naval departments have theirs in a building near the naval arsenal; there is a Sunday-evening service in the house of the Church Missionary Society; and the Wesleyan mission has a chapel, which has the external appearance of a private house. The number of Protestants in Malta is something under a thousand, not including the troops, whose religious service is performed by the military chaplain in their respective barracks. They have long desired to see a church erected for their use; this wish will speedily be realised, her majesty the queen-dowager having munificently signified her intention, on her late visit to Malta, to erect a church at her sole expense for the public worship of the church of England. The site for this building in the city of Valletta was cleared in January, 1839.

Population.—The increase of the population of Malta, after it came into the possession of the Knights of St. John, was very rapid. It seems to have been the policy of that government to stimulate it by all the means in its power. Property is still held by the present government, which is charged with the payment of annual sums, in dowries for the encouragement of marriages among the poorer people.

In 1530, when the Order took possession of the islands, the population amounted to	17,000
In 1632, according to Boisgelin . . .	51,750
In 1791, according to St. Priest . .	90,000
In 1798, according to Boisgelin . . .	114,000
In 1803, according to Colquhoun, 'Wealth of the British Empire' . .	94,000
In 1813, before the breaking out of the plague	102,000
In 1828, according to a census taken in that year	119,194
In 1838, according to the last census .	120,989

Detail of the Population, 31*st of December*, 1837.

		Males.	Females.
Malta.—	Natives	45,487	49,491
	British residents	915	553
	Aliens	3,942	729
	British troops	2,332	
	Women and others accompanying them	16	361
	Children of the troops	335	360
		53,027	51,494
Gozo.—	Natives	8,124	8,331
	British residents	8	5
		61,159	59,830
			61,159
		Total	120,989

Government.—Malta is a crown colony, and the local government is conducted by a governor, who, in legislative matters, is assisted by a council of six persons nominated by the crown. The principal administrative departments are the chief secretary's office, the quarantine department, the custom-house, the land-revenue department, and the audit-office. The courts of justice are numerous, and the procedure intricate and costly; the law administered by them is likewise in want of a thorough revision. The public revenue of the island amounts to about 100,000*l.* a year, of which about 0,000*l.* arises from custom duties (chiefly levied on grain and pulse) and quarantine dues; about 23,000*l.* from the rents of government lands and houses; and the remainder from several small duties. Out of this sum are defrayed not only the salaries of the regular government officers, but also the expenses of maintaining the roads, streets, and public buildings, and the cost of the university, elementary schools, and charitable institutions. Some reduction in the public burdens may be expected to be made in consequence of the recommendations of the recent commission of enquiry.

History of Malta.—The earliest notice of the Maltese islands is in Diodorus of Sicily (v. 12). 'There are,' he says, 'over against that part of Sicily which lies to the south three islands at a distance in the sea, each of which has a town and safe ports for ships overtaken by tempests. The first, called Melite, is about 800 stadia from Syracuse, and has several excellent ports. The inhabitants are very rich, inasmuch as they exercise many trades, and in particular they manufacture cloths remarkable for their softness and fineness. Their houses are large and splendidly ornamented with projections and stucco (*γείσσοις καὶ κονιάμασι*). The island is a colony of the Phœnicians, who, trading to the western ocean, used it as a place of refuge, because it has excellent ports and lies in the midst of the sea. Next to this island is another named Gaulus (Gozo), with convenient harbours, which is also a colony of Phœnicians.'

Malta is said to have been subsequently occupied by the Greeks; but however this may be, the Carthaginians obtained entire possession of it, B.C. 402. In B.C. 242 the Carthaginians were compelled to cede it to the Romans, who erected the island into a municipium. It appears that the temple of Juno was rich enough to be an object of plunder to the rapacious Verres, when he was prætor of Sicily. Cicero, *In Verrem*, iv. 46.) The linen cloth of Malta was considered an article of luxury at Rome.

The Vandals and the Goths, who had taken possession of Malta, were expelled by Belisarius, A.D. 533. About A.D. 70 the Arabs took possession of the island; and though it was recovered and held by the Eastern empire for about thirty-four years, it was retaken by the Arabs, and the Greek inhabitants were exterminated. In 1120 Count Roger, the Norman conqueror of Sicily, took possession of Malta, and expelled the Arabs.

Malta was thus attached to the island of Sicily, and it became subject to the different dynasties which successively governed that island, viz. the house of Hohenstauffen (A.D. 189), Charles of Anjou (A.D. 1258), and the house of Aragon (A.D. 1282). During this period an officer of the Sicilian crown presided over the government of Malta, and the Sicilian laws and institutions were extended to the island. One of these institutions was a municipal council or body, similar to the municipal councils of Sicily, which originated in the reign of Frederic II. of the house of Hohenstauffen. This municipal council appears from its archives, which are still preserved at Malta, to have exercised considerable administrative, and even legislative powers, though its formation and constitution are quite obscure.

In 1516 Sicily, with the Maltese islands, passed to the emperor Charles V., as heir to the crown of Aragon. On the 4th March, 1530, Charles granted to the grand-master and religious fraternity of St. John, who had recently been expelled from Rhodes by the Turks, the ownership of all the castles, fortresses, and isles of Tripoli, Malta, and Gozo, with complete jurisdiction. The sovereignty of Malta was by this grant in effect surrendered to the Knights, though the form of tenure from the crown of Sicily was maintained by the reservation of the annual payment of a falcon by the Knights to the king of Sicily or his viceroy. At the time of the cession Malta contained only about 12,000 and Gozo about 5000 inhabitants, who were in a miserable condition. Malta was almost a shelterless rock, and the cultivation of the land had been nearly abandoned, owing to the wretched system of administration and the frequent predatory visits to which the people were exposed.

Under the Order Malta soon began to recover from its state of destitution. The first object was to protect the island against the incursions of its piratical enemies; and with this view the Knights commenced those works which remain to this day as a monument of their perseverance and military power. On the 18th May, 1565, the Turks, under Mustapha Pacha, to the number of 30,000 choice troops, landed on the island of Malta, where they encountered a desperate resistance from the Knights. Finally, the Turks were compelled to quit the island, with the loss, it is said, of 25,000 men: the loss on the other side was computed at about 7000. Upon the death of Sultan Solyman in 1566, shortly after the defeat of his troops, the grand-master La Vallette, who had successfully defended Malta against this formidable invasion, determined on the founding of a new city, in a favourable position for the protection of the island, and as a residence of the convent of the Order. He laid the first stone of the city of Valletta, which bore the name of its founder, on the 28th of March, 1566. The Knights, now secure in their possession of Malta, continued to cruise against the Ottomans, whom they greatly annoyed. But the discipline of the Order relaxed as the objects of their original institution gradually became of secondary importance; and Malta, which was safe against all attack, was a place of luxury and pleasure rather than of austerity.

The history of the island, between this time and its surrender to Bonaparte, requires no particular notice in this brief sketch. The outbreak of the French revolution was an event calculated to shake the declining power of an institution like that of the Knights of Malta, and the behaviour of the Order towards the new republic of France, their supposed partisans, their vessels, and their agent in Malta, certainly contributed to the downfal of the Order. The immediate surrender of the island however was perhaps owing in part to the pusillanimity of the Grand-master, as it certainly was in a great degree to the treachery of the French Knights, who, foreseeing the decline of the Order and the probability of Malta being placed under Russian influence, preferred its surrender to France, whether that country should be a monarchy or a republic.

On the 9th June, 1798, a French expedition, under the command of Admiral Brueys, consisting of 18 ships of the line, 18 frigates, and about 400 transports, having 40,000 men on board, arrived off the island. The French Knights had already been prepared for what was to take place: the Grand-master Ferdinand Hompesch, who had been elected in July, 1797, a weak and credulous man, took no means to deprive the French Knights of the principal military commands. Most of the towers along the coast fell under their orders by a rule of service. Although much time was lost in concerting measures of defence, nothing was done: in fact muskets were delivered to the troops unexamined; the ammunition was damaged and missent; troops were despatched to the coast without provisions; conflicting and impracticable orders were issued, and other similar apparent accidents happened. Baron Azopardi, in his 'Journal of the Taking of Malta,' states that the inhabitants ran in thousands to arms, but the military chiefs were satisfied with a semblance of preparation, and deluded the people with assurances of security. General Bonaparte, who

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the island from the French, but they were re-
indignity.

At the commencement of the siege the quantity of corn in the granaries of Valletta and the three cities was 36,000 quarters, which it was calculated would subsist the inhabitants and the garrison about 16 or 17 months. The city was so closely blockaded by sea, there seldom being less than three or four ships of the line, and as many smaller vessels cruising off the port, that only 15 small vessels with supplies, besides the frigate *Boudeuse*, got into the port during the first twelve months; and the situation of the besieged, before scarcely four months had elapsed, was such, that Ransijat, treasurer of the Order, who has given us a very detailed journal of the occurences within the city, says that the countenances of many bore marks of the cruel privations to which they were subjected. Famine stared them in the face, and many who were at first unwilling to leave their homes and properties, were afterwards glad to obtain the permission of General Vaubois to escape from the horrors of a siege and the insatiability of military rapacity. The population, which at the beginning of the blockade had been estimated at upwards of 40,000, by this means was reduced in September, 1799, to 13,000, and consequently the corn in the magazines was sufficient to last much longer than was at first calculated: yet in the subsequent month, General Vaubois managed to send despatches to France to inform his government that his supplies would not hold out beyond the following May. The inhabitants were not a little cast down by this anticipation, particularly as in July the garrison had been put upon half-pay, and the salaries of the authorities were suspended from the scarcity of money in the treasury. Still, trying as was their situation, the buoyant spirit of the French soldiers never deserted them: they made gardens in the fortifications, and raised fruit and vegetables to ameliorate their situation. At this time a pound of fresh pork sold for 6*s*., salt meat 2*s*. 10*d*., the commonest fish 2*s*. 2*d*., a fowl 50*s*., a pigeon 10*s*., a pound of sugar 18*s*. 4*d*., coffee 21*s*. 8*d*., a good fat rat 1*s*. 7*d*.

The Maltese at first raised but few batteries, and those inconsiderable ones. When however they were joined by the English and Portuguese, who furnished them with mortars and cannon and a great quantity of ammunition, they erected others of much greater importance, in situations which kept the French garrison in constant apprehension, as we learn from Ransijat's 'Journal.' They were assisted likewise by the marines landed from the blockading squadron. In December, 1799, Brigadier-General Graham (now Lord Lynedoch), arrived with the 30th and 89th British regiments and some artillerymen; these were joined by the 35th and 48th regiments under Major-General Pigot, who took the command in June, 1800. Two Sicilian regiments also formed part of the besieging forces; and in official orders they were styled the allied troops at the blockade of Valletta.

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At the peace of Amiens in 1802, the question of Malta was one of difficult arrangement. It was however eventually settled between Great Britain and the French republic, that the island should be restored to the Knights of St. John, and be an independent state as formerly, but that there should be neither an English nor a French langue, and that a Maltese langue should be established, which should enjoy all the influence and privileges of the other langues.

In strict conformity with this treaty, Malta was to have on board the ship of the line Orient, lost no time in making a demand in writing that the whole fleet should be allowed to enter the ports of Malta to water, to which an answer was returned, with expressions of regret, that only two, or at most four ships, could be allowed to enter the port at a time. 'The Grand-master refuses us water!' said Bonaparte; 'to-morrow at sunrise the army will disembark upon the coasts of the island wherever a landing can be effected:' and these words were inserted in the order of the day.

Accordingly, the next morning a body of French troops disembarked in St. George's Bay to the north-westward of Valletta, where one gun was fired from the tower for form's sake, and the batteries of St. Elmo and Fort Tigné opened a fire, which was ineffective from their position. Another corps landed in St. Paul's Bay unmolested, and a third in the harbour of Marsascirocco, to the south-east. Before night the French were in possession of the whole country, with the exception of five villages, or casals, without any opposition on the part of the knights who commanded the several posts; and the unsupported attempts of the Maltese battalions of Nasciar, Musta, Gargur, and Birchircara to defend their homes, only afforded to troops like the French a pretext for bloodshed and plunder. In the meantime the city of Valletta was in a state of tumult and despair. The Grand master, in a state of the greatest perplexity, was surrounded by various advisers, but wanted firmness to decide. At length, when it was reported to him that some French knights had been killed, and others wounded, by the Maltese soldiers, he felt his critical situation, and determined to solicit a suspension of arms. Two messengers were immediately sent on board the Orient to announce the readiness of the Grand-master to come to terms; they were bearers of a letter from the Danish consul to the French general, interceding for his favour, and another from the Grand-master himself to the commander Dolomieu, a knight of the Order, who had openly attached himself to the French, and was on board the Orient, soliciting his good offices. In the afternoon General Junot and others brought an answer to the palace, allowing the Grand-master twenty-four hours to send his delegates to conclude the capitulation.

Distrusting their government, the inhabitants claimed to take part in the deliberations; and to two knights and four influential citizens were confided the conditions upon which the fortress was to be surrendered. On the 12th of July the capitulation was signed on board the Orient by Bonaparte himself and these delegates. By its stipulations the Order of St. John of Jerusalem renounced, in favour of the French republic, the sovereignty of Malta, Gozo, and Cumino; the French republic pledged itself to use its influence with the congress of Rastadt to procure for the Grand-master during his life a principality equivalent, and in the meanwhile he was to be allowed a pension of 300,000 francs; the French knights were to be allowed to return to their country; to the French knights then in Malta pensions of 700 francs were to be paid, and 1000 francs to those of sixty years and upwards; it engaged to intercede with the Cisalpine, Ligurian, Roman, and Helvetic republics, to obtain similar pensions for the knights of those countries, and also with the other European powers, to secure to the knights of each the property of the Order. The knights were moreover permitted to retain their private property in Malta and Gozo; and the inhabitants were to continue in the free exercise of the Roman Catholic religion; to be secure in their property and privileges, and no extraordinary contribution was to be imposed upon them. This capitulation was more favourable than could have been expected. Hompesch was not asked to ratify its conditions.

In the afternoon of the same day the French ships of war and transports anchored in the ports of Valletta and Marsascirocco, and 15,000 troops took possession of Valletta, the three cities on the other side of the harbour, and their outworks. The French general had no sooner entered the gates than he eagerly made a personal inspection of the fortifications. 'It is well, General,' said Caffarelli, one of the officers of his suite, as he accompanied him, 'it is well that some one was within to open the gates for us. We should have had some difficulty in entering had the place been altogether empty.'

The French found in the port two line-of-battle ships, one frigate, and three galleys, besides two galliots, and some guard boats; and of ordnance 1500 pieces of artillery (about 800 of which were mounted on the works), together with 35,000 stand of small arms, 12,000 barrels of powder, and an immense number of shot and shell.

The Order of Malta was now extinct. Hompesch embarked privately in a merchant-ship in the night of the 17th of June, accompanied by twelve knights. On his arrival at Trieste he resigned his office of Grand-master of the Order of St. John. General Bonaparte sailed with the French expedition two days afterwards for Egypt, and General Vaubois was left with 4000 men to take care of Malta.*

As soon as the French were masters of Malta they established laws borrowed from the recent legislation of France, and formed an entirely new government and municipality, administered by a commission. Liberty and equality were proclaimed, titles and ranks were abolished; it was decreed under a heavy fine that the sons of the richest families should be sent to France for education in the new principles, at their own expense; all the establishments were reorganised, and the remaining knights, with few exceptions, were obliged to leave the place. The riches of the church of St. John, and of the other churches, and of the *auberges* of the *langues*, the plate of the hospitals, and of the Grand-master's palace, were melted down to be sent to France. (Baron Azopardi; and *Pièces Diverses rélatives aux Opérations Militaires et Politiques du Général Bonaparte*, Paris, an viii.)

Three months of subjection to such arbitrary measures and violent changes were sufficient to convince the Maltese that they had exchanged an enfeebled despotism for a harsh yoke. A total disregard of the articles of the capitulation was daily manifested, and even some alterations of the civil law which affected the tenure of property filled up the measure of hatred to their new rulers.

Besides the churches which had been pillaged in Valletta, those at Città Notabile, including the cathedral, did not escape plunder; but there still remained some rich silk damask in the churches and convents of the antient city. On the 2nd of September, 1798 (after the news of the battle of Aboukir had reached Malta), some persons being sent to Città Notabile to take down these decorations, the inhabitants assembled to prevent it. The French commandant of the small garrison of sixty-five men, in an endeavour to disperse them, imprudently drew his sword. In a moment he was attacked, and the people being joined by others from the neighbouring casals, the irritation increased, and the officer and the whole of the detachment were massacred, and their bodies burned. This was the signal for a general revolt. In twenty-four hours the insurrection spread throughout both islands. On the 3rd, General Vaubois having learned what had taken place, attempted to send a detachment of 200 men to keep possession of Città Notabile, but they were beaten back by the Maltese peasantry. On the same day the people of the villages near the fortifications of Cottonera entered the town of Burmola, and, being joined by the inhabitants, attacked the French guard and carried off the standard of the republic. Others in the meantime took possession of a magazine, and after a sharp contest bore away to the country eighty barrels of gunpowder.

The energy and daring which the Maltese thus early showed in their patriotic warfare surprised General Vaubois, who had been accustomed to consider them as wretched peasants. From this moment the gates of Valletta and the three cities were closed, and the garrison was kept in a close state of blockade for two years.

During this long period the Maltese gave proof of a patriotic ardour and long-suffering which few people would have equalled. Unanimous in their object, all their measures were taken with prudence and order. They collected arms and established a system which gave method to all their operations, and their levy of men was divided into bodies or battalions, and distributed in the towers on the coast and throughout the country, with almost as much order as regular troops.

The attempts made by the French general at conciliation were not listened to; his messengers were never allowed to go back; and he soon found to his surprise that the people had firmness enough to persevere in the enterprise they had undertaken, nothwithstanding they were at present single-handed.

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* The only detail we have of these transactions in English is by the Chevalier de Boisgelin ('Antient and Modern Malta,' London, 1805), who was a French knight of Malta; and he writes in the true spirit of an adherent to his Order. The present account of the surrender to the French, and what follows on the subsequent blockade by the British and Maltese, was written on the spot, and is confirmed or corrected by persons who were contemporary with the events.

With more than 6000 well-disciplined troops under his command (the soldiers and the crews of the vessels which escaped from Aboukir having been incorporated with them) he was unable to make a sortie in sufficient force to overawe his enemies; for the people of Valletta, encouraged by the movement of their countrymen, and borne down by forced contributions and the privations inseparable from a state of siege, were not to be left unwatched within the walls. The Maltese now made a warm appeal to the king of Sicily as their sovereign. They sought assistance from the British fleet, and sent out boats in all directions, some of which fell in with a vessel that communicated with Lord Nelson on his return from the battle of Aboukir: he sent the Portuguese squadron to their aid, his own ships being much disabled, and promised soon to follow. In fact on the 18th of September four Portuguese ships of the line and two frigates came off the island and commenced the blockade of Valletta, and supplied the Maltese with some arms and artillery. On the 25th of October Lord Nelson himself appeared with fourteen ships of war, and summoned the French to surrender, offering to send them all to France, and not consider them as prisoners of war; to which General Vaubois returned a laconic refusal. The English admiral's force not being in a state to keep the sea, he was obliged to go to refit, and he left the Portuguese admiral to maintain the blockade. So noble and encouraging was his reception of the Maltese deputies, that Nelson's name served as a word to animate their efforts throughout the rest of their long struggle.

All sorts of provisions still continued very scarce, and many of the inhabitants were reduced to the greatest misery. The king of Sicily, who had already supplied them with powder and shot, now permitted them to receive corn from his granaries upon credit. Yet their great support was the reliance they had on the presence of the British navy. Captain Alexander John Ball, who commanded the squadron afterwards appointed by Lord Nelson to continue the blockade of Valletta, was likewise ordered to supply as far as practicable the wants of the Maltese. This service could not have been entrusted to better hands. Captain Ball was a man whose dignified deportment and mild and affable manners were such as to acquire respect and esteem; his sympathy and consideration too for the Maltese was a sentiment of the heart, not a cold act of duty.

In the beginning of 1799 the Maltese elected him their chief and the president of their congress, which was immediately organised, and consisted of the bishop's delegate in ecclesiastical matters, a judge, and twenty-two representatives elected by the casals. The affairs, civil and military, of the Maltese now began to take the form of a regular administration under the direction of Captain Ball. The congress authorised a public loan to be opened, and the landed property of the church and of the late Order to be let for the purpose of paying the expenses of the war. The customs were also regulated, and the bays of St. Paul and Marsascirocco were made the authorised ports for trade. In April Captain Ball received, through the British minister at the court of Naples, an order from the king of the Two Sicilies to assume the command of Malta for his majesty, and the Neapolitan flag was now raised upon the Maltese batteries in conjunction with the English. A sum of money (about 3600*l.*) was about this time received for the first time, and was afterwards followed by others, which although supplied in the name of the king of Naples, were really furnished from the English subsidies. Very soon after this Lord Nelson authorised Captain Ball to assure the islanders that Malta would be protected by England, Russia, and Prussia until a general peace. All matters therefore seemed to be as well regulated as circumstances would admit, and the most ardent hopes were entertained that an end might speedily be put to the sufferings of the Maltese by the surrender of the French garrison, which was now strictly watched by land as well as by sea. But they had still much to contend against, and among other calamities disease, brought on by long suffering, and famine carried off many of the poorest classes, for whose relief no charitable fund existed; and it is stated that during the two years not less than 20,000 persons died of misery and famine. The expelled knights of the Order were not indifferent to what was going on in Malta; the bailiff de Neveu and some others attempted to land, offering their services to assist in recovering the island from the French, but they were rejected with indignity.

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In strict conformity with this treaty, Malta was to have been evacuated by the British troops in three months after its ratification. But before the lapse of that period, circumstances had arisen which not only retarded the restoration of the island to the Knights of St. John, but rendered that measure inconsistent with the interests of Great Britain, and the security of her Indian possessions. Thus the treaty of Amiens remained unexecuted, and Malta remained in the hands of the English. On the 18th of the same month George III. issued a declaration of the motives which obliged him again to take up arms.

During the hostilities which followed, Malta was retained in military possession by Great Britain, without any formal declaration as to who was to be its future master. It became the head-quarters of the English army in the Mediterranean, and the rendezvous of the British fleet, which found there every advantage from a central situation, and the convenience the ports of the island afforded for fitting out and keeping in an effective state the squadrons which held the dominion of the seas from Gibraltar to the Dardanelles. It became the emporium of that commerce which was shut out from all the ports of the Continent by the operation of the Berlin and Milan decrees, and it was the only place in the Mediterranean whither the rich prizes taken from the enemy were carried for adjudication. This was a time of great prosperity to Malta; it however received a sudden interruption from the plague which broke out in 1813. From April of that year, when Valletta was so active in traffic and bustle, to September, 1814, there died 4668 persons in both islands. During the greater part of this period the capital was deserted, except by the mournful dead-cart; the grass grew in the streets, and everybody was shut up as in a prison.

On the 30th of May, 1814, a definitive treaty of peace, concluded at Paris between France and the allied powers, fixed definitively the lot of Malta, by a formal recognition of her union with Great Britain, with the concurrence of the king of Sicily, whose predecessors had for three centuries only exercised suzerainty over the island. Thus the Maltese people at length obtained the fulfilment of their wishes, and became subjects of a sovereign of their own choice. It is only under a great maritime power that they can be secure from aggression.

But the island did not recover its late excess of prosperity. The peace, which carried blessings to all the nations of Europe, opened the ports of the Continent to English commerce, which naturally neglected Malta and went thither direct. Malta besides was obliged to suffer a sort of penance inflicted upon her by the ports of France and Italy, whose health establishments kept her in quarantine for 12 years after the cessation of the plague. It was not until June, 1826, that she was admitted to communicate freely with these commercal states; and by this time her principal commercial establishments were broken up. The expenditure of a garrison and a small squadron, and a limited trade with Barbary and the Levant, were her only resources, and formed no approach to the florid state of prosperity she enjoyed soon after her first connection with Great Britain.

In the mean time her already excessive population was upon the increase, and her expenditure undiminished, and in 1832 the people began to petition his late majesty, William IV., for a consideration of their depressed condition, alleging certain grievances, which were then but cursorily considered or ineffectually remedied. In June, 1836, they made a more forcible appeal to the British government through the House of Commons, by a petition signed by 2388 Maltese, which was presented in that house by Mr. Ewart, on the 7th of June, 1836. The Maltese in this appeal prayed for a municipal body, a reform of the law, a moderate liberty of the press, an improvement of the system of education and elementary instruction, an independent board of health, a free port, a relief from the heavy excise duty on wine, a participation in the emoluments of office, a relief from the heavy duty on grain, and a popular council for the election of representatives to make known their wants and grievances. Commissioners of Inquiry were sent out in September, 1836, to examine and report upon the grievances set forth, and from their labours the most useful reforms are anticipated. Some indeed are already in operation: such as a complete freedom of the ports of Malta for all foreign merchandise, the duties remaining only on articles of consumption; the reform of the government departments, and the distribution of the higher offices more fairly among the Maltese, which were formerly held almost exclusively by Englishmen through patronage; a reconstruction of the university, and the introduction of elementary education amongst the lower orders; and though last, not least, the full liberty of printing and publishing, under laws to be enacted, by which the people will always be enabled to make known their complaints to the British government and the British people.

What promises however to be of the greatest benefit to Malta is the development of steam navigation in the Mediterranean within these few years past, not only from the passage of vessels from the coasts of France and Italy to the Levant, which all meet at Malta as the most advantageous point of rendezvous, and to provide themselves with coals, but from the increasing importance of the communication between England and India through the Mediterranean. Travellers of all nations are to be seen in the streets of Valletta, and there, where a few years ago every face was familiar, one now walks amongst strangers as in continental cities. This affluence of persons has led to the establishment of hotels of the best sort; and the improvements in the lazaret have stamped Malta as the most important quarantine station in the Mediterranean, and that which is now most resorted to by travellers of all countries.

MALTA, KNIGHTS OF, a celebrated military and religious order, known also by the names of Knights of St. John of Jerusalem, Knights Hospitallers, and Knights of Rhodes. The institution of the Order originated in an hospice which was founded at Jerusalem, by permission of the caliphs of Egypt, about the middle of the eleventh century, for receiving the pilgrims from Europe who visited the holy sepulchre. The hospice was annexed to a chapel dedicated to St. John the Almoner, and was at first kept by Benedictine monks. When Palestine was conquered by the Seljuk Turks, in 1065, who drove away the Arabian and Egyptian Saracens, the Christians found these new masters much worse than the former, and the hospice of St. John was plundered. Some time after, a Frenchman named Gérard, a pilgrim to the holy city, undertook the management of the hospice; and when the crusaders under Godefroy de Bouillon took Jerusalem in 1099, they found Gérard, who had been kept in prison by the Mussulmans during the siege as a suspected person. Gérard resumed his duties in the hospice, and several of the crusaders, through pious fervour, determined to join him and to devote the rest of their lives to the service of the poor pilgrims. Among the knights who took this determination were Raymond Dupuy and Dudon de Compt, both from Dauphiné, and Conon de Montaigne, from Auvergne. Godefroy de Bouillon made a donation of his own lordship of Montboire in Brabant to the hospice of St. John, and several other princes followed his example. The hospice thus became possessed of lands in almost every part of Europe, as well as in Palestine. The dress assumed by the new Hospitallers was black, with a white cross, having eight points or arms on the left breast. Pope Paschal II. sanctioned the new institution, the members of which bound themselves by solemn vows of chastity, individual poverty, and obedience, to which was afterwards added that of being always ready 'to fight against Mussulmans and all others who forsake the true religion.' Vertot, at the end of his 'History,' gives all the laws and regulations of the Order: 'Anciens et nouveaux Statuts de l'Ordre de St. Jean de Jerusalem.' The pope exempted them from paying tithes, and gave them the right of electing their own superior, who was styled grand-master. They were independent of every other ecclesiastical or lay jurisdiction. A splendid church was raised by Gérard near the old hospice, and dedicated to John the Baptist, with extensive buildings for the Hospitallers as well as the pilgrims, who were there entertained at free cost. Gérard and his successors established, in various maritime towns of Europe, hospices in imitation of that of Jerusalem, which served as resting-places for the pilgrims, who were there provided with the means of embarking for Palestine. These houses were called commanderies. Such were those of Messina, Tarentum, Seville in Spain, and St. Gilles in Provence.

Gérard dying in 1118, the Hospitallers elected as his successor brother Raymond Dupuy, who drew up a body of statutes or regulations of discipline for the Order. He first added to the duties of charity and hospitality that of taking up arms for the protection of the holy sanctuary. He divided the brethren into three classes, the military, the priests and chaplains, and the 'serving brothers,' who were neither soldiers nor priests.. As the Order increased rapidly in numbers, the members were classed into seven nations, called 'languages,' namely, Provence, Auvergne, France, Italy, Aragon, Germany, and England. For nearly two centuries the Hospitallers, together with the Templars, were the firmest support of the Christians in the East; and when Acre, the last bulwark of Christendom, was taken by the Mussulmans in 1291, the remains of the Order withdrew to Cyprus, where the town of Limisso was assigned to the Hospitallers as their residence.

In the year 1310 the Hospitallers, having lost all hope of recovering Palestine, equipped a fleet, and, being joined by crusaders from Italy, landed, under their grand-master Foulques de Villaret, on the island of Rhodes, which was then possessed by Greek and Saracen pirates. The Hospitallers defeated the pirates, and took formal possession of Rhodes, as well as of Cos and other neighbouring islands. [RHODES.] From that time they became known by the name of Knights of Rhodes. The knights strongly fortified the town of Rhodes, from which they carried on by sea a deadly warfare against the Mussulmans, and especially against the Ottoman Turks, who about that time were establishing their power all over Asia Minor. The history of the Knights of Rhodes, during the fourteenth and fifteenth centuries, is closely connected with that of the Ottomans. Some of the Turkish sultans, among others Amurath, or Mourad II., were glad to purchase a temporary peace from the knights. Mahomed II., son of Murad, having taken Constantinople, sent a fleet with an army to conquer Rhodes in 1480; but the Turks were repulsed by the knights, under their grand-master Pierre d'Aubusson. In 1522, Sultan Solyman the Great sent another large armament against Rhodes, and he himself repaired thither to direct the siege. Villiers de l'Isle Adam, who was the grand master of the Order, defended the town with the utmost bravery; but there was a traitor among them, one D'Amaral, a Portuguese knight, who, through jealousy and disappointment at not being made grand-master, kept a correspondence with Solyman, and informed him of the state of the garrison and the weak points of the fortifications. D'Amaral was discovered and executed; but in December of that year the grand-master, having exhausted all his means of resistance, capitulated. Solyman behaved honourably: he allowed the knights, and all the inhabitants who chose to leave Rhodes, twelve days to embark with their moveables. Having expressed a wish to see the grand-master, he gave him words of consolation, and, touched by his venerable appearance, said to his vizier, that 'He could not help being grieved at driving that Christian in his old age out of his house.' On the 1st of January, 1523, the grand-master and the surviving knights left Rhodes and took refuge in Italy.

In 1530 Charles V. gave to the Order the islands of Malta and Gozo. [MALTA.]

After the surrender of Malta to the French, in 1798, the Order as a sovereign body became extinct, and its domains in various parts of Europe were confiscated. It still however exists as a religious order, a phantom of its former greatness. Ferrara in the Papal State is at present the residence of the grand-master and a few knights of the order of St. John of Jerusalem, who subsist upon some scanty remnant of their antient splendid revenues. Circumstances have so much altered in Europe, the Levant, and Africa, that the Knights of Malta as a sovereign military order would no longer be in harmony with the actual state of civilization. The objects of their institution have long ceased to exist. They were however for some centuries, together with Venice, the firmest bulwarks of Italy and western Europe against the barbarian power of the Ottomans.

(Vertot, *Histoire des Chevaliers Hospitaliers de St. Jean de Jérusalem.*)

MALTHA, a bituminous mineral, of which such different accounts are given by various authors, that it is impossible to determine to what substance the name properly belongs. In proof of the justness of this conclusion, we may merely observe that according to Phillips (*Mineralogy*, p. 368), it is blackish-brown; while according to Dr. Thomson (*Inorganic Chemistry*, vol. ii., p. 369), it is white.

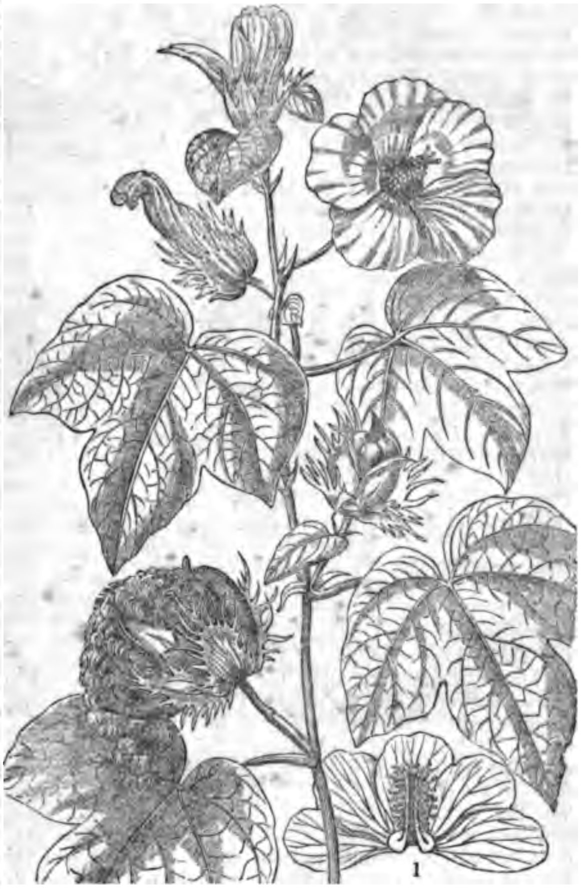
MALTHUS. [POPULATION.]

MALTON. [YORKSHIRE.]

MALU'RUS. [SYLVIADÆ.]

MALVA SYLVESTRIS (Wild Mallow), an indigenous, perennial, herbaceous plant, of very frequent occurrence, possessed in every part of mucilaginous properties, and which may be employed for the same ends as other demulcent herbs. The flowers only are officinal in Britain: when fresh, they are violet-coloured, but by drying become blue, and also lose a large quantity of their watery constituents, for 100 parts of recent flowers dry into 11. They have no odour, but a mucilaginous herbaceous taste. They yield their colouring principle both to water and alcohol. The alcoholic tincture furnishes one of the most delicate of re-agents for testing the presence of acids or alkalies. The compound decoction of the London Pharmacopœia is not a proper form of exhibition, an infusion with cold water being preferable. [DECOCTIONS; INFUSIONS.]

MALVA'CEÆ are a large natural order of exogenous plants, the distinguishing marks of which are polypetalous flowers, monadelphous stamens, unilocular anthers, and a valvate calyx. They also have alternate leaves, the hairiness of which, if present, is usually stellate; and conspicuous stipules. A large proportion of the order consists of herbaceous or annual plants, inhabiting all the milder parts of the world, but much the most plentiful in hot countries, where alone a comparatively small number of species become trees. In many cases they are remarkable for the large size and beautiful colours of their flowers, which are however fugitive, expanding for a single day only; the great number of them and the regularity of their succession during the flowering season make this of little importance. Among the very numerous species several are of essential service to man. As emollients they are well known in medical practice, the Marsh-mallow (Althæa officinalis) being one of the most useful among this kind of remedial substances, and a large proportion of the whole order being capable of supplying its place. The hairy covering of the seeds of the various species of Gossypium forms the raw cotton so important to our manufacturers. Malva tricuspidata is used by the negroes in the West Indies as a substitute for soap. The seeds of Hibiscus abelmoschus are warm and musky, and are employed in perfumery as a substitute for musk; those of Hibiscus esculentus form the ochra, so much used in hot countries as a mucilaginous in-



Gossypium tricuspidatum.

1, a section of a corolla, with adhering monadelphous stamens.

gredient in soups. A few species are acid, especially Hibiscus sabdariffa. Finally the tenacious fibres procured from the inner bark of many kinds of Malvaceous plants form a good description of cordage. Hibiscus elatus and tiliaceus, and several kinds of Sida, are principally used for this purpose.

The only modern systematical account of the genera and species of the order is to be found in the first volume of De Candolle's 'Prodromus;' but the genera have been since constructed upon principles so much more precise, and the number of species has been so very considerably increased, that this enumeration is of little use at present. There is a good account of Indian species in Wight and Arnott's 'Prodromus Floræ Peninsulæ Indiæ Orientalis;' of Brazilian species in Auguste de St. Hilaire's 'Flora Braziliæ Meridionalis;' and of Mexican kinds many are described in the various volumes of the 'Linnæa.' A few African species are also to be found in Guillemin and Perrottet's 'Flora Senegambiæ,' vol. i.

MALVERN, MALVERN HILLS. [WORCESTERSHIRE.]

MALWA. [HINDUSTAN, p. 212.]

MAMELUKES, or MEMLOOKS, a name derived from an Arabic word signifying slaves, was that of a military body which for a long time ruled Egypt. The Memlooks were first instituted in the early part of the thirteenth century by Malek Salech, grandson of Safadeen, which Safadeen was the brother of the famous Salah Edeen, the Koord, the founder of the Eyoob dynasty of the sultans of Egypt, which succeeded the Fatemides. Malek Salech purchased many thousands of slaves, with which the markets of Asia were then glutted in consequence of the devastating wars of Gengis Khan. He chose chiefly young natives of the Caucasian regions, whom he trained to military exercises, and embodied into a corps of 12,000 men called Memlooks. This corps, by its discipline and distinct organization, became formidable to its masters. In 1254 the Memlooks revolted and killed Tooran Shah, the last prince of the Eyoobite dynasty, and raised to the throne of Egypt El Moez Turkoman Memlook. El Moez was murdered in 1261 by another Memlook called Baybers, who founded the dynasty of the Baharites, which conquered Syria, took Damascus, and put an end to the domination of the Abbaside caliphs. In 1382 Doulet el Memlook el Borgéeh, a Circassian Memlook, overthrew the Baharite dynasty, and founded the dynasty of the Circassian Memlooks, which, after losing all the conquests of the Baharites in Asia by the hands of the Ottomans, continued to rule Egypt till 1517, when Selim I., sultan of the Ottomans, marched into Egypt, defeated the Memlooks near Heliopolis, took Cairo, and put to death Tomaun Bey, the last of the Circassian dynasty. Selim however maintained or was obliged to maintain the Memlooks as a military aristocracy in Egypt. The Beys of the Memlooks, twenty-four in number, continued to be the governors of as many districts, though subject to a Pacha, appointed by the Porte, who resided at Cairo. The beys were elected by their own body. [EGYPT, *Modern History of.*] This aristocracy continued to rule almost independent of the Porte till Bonaparte's invasion, when the bulk of Memlook cavalry was destroyed in several brilliant but useless charges upon the French squares supported by artillery, at the battle of the Pyramids, in July, 1798. [BONAPARTE.] The remains of this once splendid body with their beys retreated into Upper Egypt. After the English and the Turks had reconquered Egypt in 1801, the Porte was no longer inclined to allow the Memlooks to retain their former authority, and the captain Pacha treacherously murdered several of the beys whom he had invited to a conference. At last, in 1811, Mehemet Ali, pacha of Egypt, by a similar contrivance, destroyed nearly all the remainder of them in the citadel of Cairo. A few escaped into Dongola, but the victorious troops of the Pacha pursued them, and they are now extinct as a body. The Memlooks were recruited entirely from Caucasian slaves. The office of bey was not hereditary, but elective among them. Their morals were very depraved: they were rapacious and merciless, and their extinction has been rather an advantage than a loss to humanity.

MAMERS. [SARTHE.]

MAMMA'LIA, MAMMALS, a term employed by Linnæus to designate those animals which suckle their young, and which, in our opinion, is far preferable to the term *Mammiferes* generally used by the French zoologists. Mammals are vertebrated animals whose blood is red and warm, and whose system of circulation is double; whose fœtus, in most species,[*] is nourished in utero by means of a placenta; whose young, when born at the proper period, give signs of life at their birth, and are, in a state of nature, afterwards fed with milk secreted by the mammæ of the mother, till they are old enough to procure their food, or to have it supplied from other sources.

Linnæus, who makes the Mammalia the first class of the Animal Kingdom, gives the following definition:—*Heart* with two auricles and two ventricles; *blood* warm, red. *Lungs* respiring reciprocally. *Jaws* incumbent, covered; armed with teeth in most. *Penis* intrans viviparas, lactiferas. *Senses:* tongue, nostrils, eyes, ears, *papillæ* (touch). *Covering:* hairs, &c. *Support* (Fulcra): four feet, except in those which are entirely aquatic, in which the posterior feet are bound together (compedes) into the fin of the tail. *A tail* in most.

This class Linnæus divides into orders, principally resting on the basis of dentition. His name for the incisor teeth is *primores;* for the canine or cuspidate teeth, *laniarii;* and for the back or grinding teeth, *molares*.

The orders, which are six in number, are comprised in three sections, depending on the nature of the extremities. 1. The *Unguiculata*, containing the orders *Bruta*, *Glires*, *Primates*, and *Feræ*. 2. The *Ungulata*, comprising the *Belluæ* and *Pecora*. 3. The *Mutica*, consisting of the order *Cete* (Whales) only.

1. The *Primates* consist of the genera Homo, Simia, Lemur, and Vespertilio.

2. The *Bruta* comprise the genera Elephas, Trichechus, Bradypus, Myrmecophaga, Manis, and Dasypus.

3. Under the *Feræ* are arranged the genera Phoca, Canis, Felis, Viverra, Mustela, Ursus, Didelphis, Talpa, Sorex, and Erinaceus.

4. The *Glires* embrace the genera Hystrix, Lepus, Castor, Mus, Sciurus, and Noctilio.

5. The *Pecora* comprehend the genera Camelus, Moschus, Cervus, Capra, Ovis, Bos.

6. To the *Belluæ* belong the genera Equus, Hippopotamus, Sus, and Rhinoceros.

And 7. Under the order *Cete* are arranged the genera Monodon, Balæna, Physeter, and Delphinus.

For the history of the science relating to the arrangement of the *Mammalia* generally, the reader is referred to the article MAMMALOGY; and for the natural history and organization of the beings which form the class, to that article and the articles MAN, MAMMARY GLAND, DENTITION, as well as the various titles referrible to the orders, families, and genera belonging to the class in this work.

MAMMA'LOGY, a hybrid word, the roots being derived from the Latin and the Greek. Accordingly M. Desmarest has proposed the term *Mastology*, and M. de Blainville that of *Mastozoology*, as being entirely of Greek origin, and therefore of more legitimate construction. Vicious however as the word is, the term *Mammalogy* is in such general use by the zoologists of England and France, that it seems to be less objectionable to retain it, with all its faults, than to attempt to supersede it by another word, which, though it may be more correct, would be comparatively very little known.

Mammalogy then is the science which has for its object the study and classification of animals with *mammæ*, or teats, that is to say, Man, and quadrupeds properly so called, including the quadrumanous animals and Whales.

The objects of this science are numerically much less than those which constitute the other classes of animated beings; their bulk, as compared with that of the others, is generally speaking of greater volume, and their structure is more readily laid open by the knife of the zootomist; whilst, with the exception of those passages by which nature gradually passes from one form to another, their differences are more strongly marked. Their habits too are better known, and consequently they afford materials for classification capable of a comparatively certain arrangement.

To a certain extent the knowledge of mammalia and their nominal distinctions, as regards their habits and economic uses, must have been of the earliest date. The Holy Scriptures abound with passages to confirm this statement, if indeed it needed confirmation. Antient monuments too, long anterior to the times of the Greeks and Romans, speak the same language. When we come down to the time of

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[*] A placenta does not exist in the Marsupials and the Monotremes.

Aristotle, we find that the science had not proceeded further than a knowledge of the external and internal structure of these animals, without any attempt at a systematic arrangement of them.* If we descend lower, we find the science in the same state, whether we consult the works of Pliny, or of the other antient writers who followed Aristotle.

Conrad Gesner, though he treated of the Mammalia alphabetically in his 'History of Quadrupeds' (1551), finally divided them into groups, such as Monkeys, Horses, Deer, Oxen, &c., as indeed he did with regard to the oviparous quadrupeds (Tortoises, Lizards, Frogs, &c.).

Aldrovandus, Jonston, and the rest of that class of mammalogists, seem to have followed Gesner as closely as the antient writers followed Aristotle.

The first great step in system was made by our countryman John Ray, in his 'Synopsis Methodica Animalium' (1693), wherein he separated the *Mammalia* into two great classes, the *Ungulated*, or Hoofed animals, and the *Unguiculated*, or animals with nails or claws.

The *Ungulated* class are divided into—1, the *Solipedes*, as the horse; 2, quadrupeds with a divided hoof properly so called, as the ox or sheep; and 3, quadrupeds which have the feet divided into more than two parts, as the elephant.

The animals with a divided hoof are again subdivided into two sections: 1, *those which do not ruminate*, as the the hog; 2, *Ruminants*, which last consist of four genera, Sheep, Goats, Stags or Deer, and Oxen.

Those of the Unguiculated Mammals which have the nails wide and resembling those of man, such as the Apes or Monkeys, are separated from those which have the nails sharp and narrow. These last he separates into those which have a bifid foot, as the *Camels*, and into those which have a multifid foot, which he names *Fissipedes*.

The *Fissipedes* are subdivided into—1, the *Analogous* group, which have more than two incisor teeth in each jaw, as the Lions or Great Cats, the Dogs, &c., or two incisors only, as the Beaver, the Hares, the Guinea Pigs, the Squirrels, the Marmots, &c.: 2, the *Anomalous* group, which have no teeth at all, as the *Tamandua*, and other Ant-eaters [ANT-EATER, vol. i.], or which have teeth differing in form, in number, and position from those of the other Mammals, as the Hedgehogs, Armadillos, Moles, Sloths, &c.

Our limits will not permit us to do more than allude to the authors, and they were not few, who entered upon this branch of the science after Ray. Of these Seba may be considered one of the principal, and his work is justly appreciated for the number, and, generally speaking, for the accuracy of the well-executed plates which illustrate his voluminous work. But there now arose one who was eminently distinguished from the crowd of zoological authors. Linnæus, an outline of whose system we have already given [MAMMALIA], fixed the science upon a basis which his penetrating genius immediately saw was the secure one. He may be said to have invented a language admirably adapted for the wants of that science; and it is in this department that the great Swedish naturalist shines preeminently as a zoologist. In vain was the splendid genius of Buffon arrayed against him and his pupils; in vain did Klein, who seemed to live for no other purpose than to attack the Swede, publish his 'Quadrupedum Dispositio brevisque Historia Naturalis' (1751), wherein he separated the Mammalia into two groups, the Ungulated and Unguiculated, each consisting of five families; in vain did Brisson (1756) publish his 'Animal Kingdom divided into eleven classes,' containing eighteen orders and forty-two genera, some of the latter well defined and still admitted; the philosophical system of Linnæus daily gained ground, and at length became almost the universal language of zoology.

About a year before the death of Linnæus (1777) Erxleben published his 'Systema Regni Animalis.' It contained several new genera, as for example *Pupio*, *Cercopithecus*, *Cebus*, *Callithrix* (all at the expense of the great Linnæan genus *Simia*), *Lutra*, *Cavia*, *Glis*, *Spalax*, *Dipus*, *Antilope*, and *Hydrochærus*, all of which are still retained; and indeed his work, which should be in the hands of the student, seems to have been intended as a further development of the Linnæan system, and of the principles contained therein.

The excellencies of the work last mentioned are strongly contrasted with the edition of the 'Systema Naturæ' which Gmelin gave to the world in 1788. It is not passing a severe judgment to characterise it as a jumble of all that had been previously contributed to this department of zoology, and a farrago of species heaped together, without care, and in many instances without inquiry. The student whose lot it may be to follow out the synonyms of the Mammalia will perceive in what a labyrinth he gets involved as soon as he sets to work upon the names and references which swell out the 'Systema Naturæ' from the neat proportions which graced it when it left the hand of Linnæus, to the undigested and overladen mass which Gmelin has made it.

Previously to this visitation, a work of a very different character had made its appearance. In 1780 Professor Storr published his 'Prodromus,' which gave a direction to those employed in classifying the Mammalia still in a great measure followed. He divided the class into three Phalanxes: the first consisting of those Mammals which have feet proper for walking; the second, of those whose feet are fin-shaped, but with distinct toes; and the third, of those which have true fins without any *apparent* toes. These phalanxes are separated into cohorts, orders, tribes, sections, and genera; and the system is well worthy the deep attention of the reader.

Boddaert (1785), in his 'Elenchus Animalium,' divided the Mammalia into two great groups, the *Terrestrial* and the *Aquatic*. In the first (*Terrestria*) he placed—I. The *Unguiculated Mammals* divided into two sections, *α*. The Quadrumania; *β*. The Unguiculata with long claws (Sloth, Bats, Armadillos, Pangolins, and other Ant-eaters). II. The *Carnivorous Mammals* (Feræ). III. The *Rodent Mammals* (Glires). IV. The *Ruminants*. V. *Ungulata* not ruminants (Hog, Horse, Tapir, Rhinoceros, and Elephant).

In the 2nd group (*Aquatilia*) were arranged the Hippopotamus, Beaver, Otter, Walrus, the Seals and Dugongs, and the Manatee. Not to detain the reader with the Anatomical System of M. Vicq-d'Azyr, which broke up the Mammalia into fifteen classes and thirty-eight genera, and is seldom referred to, we proceed to notice the system of Blumenbach, who separated the Mammalia into nine orders. I. *Bimana* (Man). II. *Quadrumana* (Apes, Monkeys, and Macaucos). III. *Chiroptera* (Bats). IV. *Digitata*, consisting of three sections, the Rodents (Glires), the Carnivorous (Feræ), and the Edentata (Bruta). V. *Solidungula* (Horse, &c.). VI. *Bisulca* (Ruminants). VII. *Multungula* (Hog, Tapir, Elephant, Rhinoceros, &c.). VIII. *Palmipeda*, consisting of three sections, viz. the Rodent Palmipedes (Glires, Beavers), the Carnivorous Palmipedes (Seals, Otters), and the Edentate Palmipedes (Bruta, Ornithorhynchus, Walruses, Dugongs). IX. The *Cetacea* (Whales).

In 1798 Cuvier published his Elementary Table of Animals, which was afterwards further developed in his *Anatomie Comparée* and the *Règne Animal*. The method of this great zoologist bears considerable resemblance in some of its parts to the 'Prodromus' of Storr, as Cuvier himself remarks: it is so generally adopted that we shall presently give it in detail.

M. Desmarest (1804—'Dictionnaire d'Histoire Naturelle'), principally taking Cuvier and Storr for his guides, divided the Mammalia into three great sections. I. The Unguiculated Mammalia. II. The Hoofed Mammalia (Mammifères à sabots). III. The Finned Mammalia (Mammifères à nageoires), containing the orders Amphibia, Seals, Walruses, Dugongs, &c., and Cetacea (Whales). Our limits will not permit us to enter at length into the classification of M. Desmarest, which should however be carefully perused by the student.

We now proceed to lay before the reader Cuvier's arrangement after it had received the benefit of the joint labours of M. Geoffroy and himself, and as it finally left his hands in his last edition of the 'Règne Animal.'

Class Mammifères.

Order I. *Bimana*. Man.

Order II. *Quadrumana*. Two families. 1. Apes and Monkeys (Simia, Linn.). 2. Macaucos (Lemur, Linn.).

Order III. *Carnassiers*. Family 1. Cheiroptera (Bats). 2. Insectivora (Hedgehogs. Tenrecs. Tupaia. Shrews Mygale. Chrysochloris. Talpa. Condylura. Scalops). 3. Carnivora. Tribe 1. Plantigrades. Bears (Ursus, Linn.). Raccoons (Procyon, Storr.). Panda (Ailurus, F. Cuv.). Benturongs (Ictides, Valenciennes). Coatis (Nasua, Storr) Kinkajous or Pottos? (Cercoleptes, Illiger). Badgers (Mele

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* Aristotle's classification was a classification of organs, not a classification of animals.

Storr). Gluttons (Gulo, Storr). Ratels. Tribe 2. Digitigrades. Martins (Mustela, Linn.). Skunks (Mephitis, Cuv.). Otters (Lutra, Storr). Dogs (Canis, Linn.). Civets (Viverra). Genets (Genetta, Cuv.). Paradoxurus. Ichneumons (Herpestes, Illiger). Suricates (Ryzæna, Illiger). Crossarchus. Proteles. The last subdivision of the Digitigrades is composed of the Hyænas (Hyæna, Storr), and the Cats (Felis, Linn.), in which last the sanguinary development is at its height. Tribe 3. Amphibia. The Seals (Phoca, Linn.). The Walruses (Trichechus, Linn.).

Order IV. *Marsupialia.* Subdivision 1. Opossums (Didelphis, Linn., including Cheironectes, Illiger, and Thylacinus and Phascogale, Temminck). Dasyurus (Geoffroy). Perameles (Geoffroy). Subdivision 2. Phalangista (Cuv.), including the true Phalangers (Balantia, Illiger) and the flying Phalangers (Petaurus, Shaw; Phalangista, Illiger). Subdivision 3. The Potoroos, or Kangaroo Rats (Hypsiprymnus, Illiger). The Kanguroos (Macropus, Shaw; Halmaturus, Illiger). The Koalas (Lipurus, Goldfuss; Phascolarctos, Blainville). Phascolomys (Geoffroy).

Order V. *Rodentia.* The Squirrels (Sciurus, Linnæus, including Tamia? Illiger; Pteromys and Cheiromys, Cuvier). The Rats (Mus, Linnæus, including Arctomys, Gmelin; Spermophilus, F. Cuvier). The Souslik (Cynomys of Rafinesque); Myoxus, Gmelin; Echimys, Geoffroy (Loncheres, Illiger); Hydromys, Geoffroy; Capromys, Desmarest. The Rats properly so called, Mus, Cuv. The Jerbilles, Gerbillus, Desmarest; Meriones, Illiger; Meriones, F. Cuvier. The Hamsters, Cricetus, Cuv., and Arvicola, Lacépède. The Ondatras, Fisher, F. Cuv. The Field Rats and Mice, Arvicola, Cuv., Hypudæus, Illiger. The Lemmings, Georychus, Illiger; Otomys, F. Cuv. The Jerboas, Dipus, Gmelin: Helamys, F. Cuv.; Pedetes, Illiger; Spalax, Guldenstädt; Bathyergus, Illiger; Geomys, Rafinesque; Pseudostoma, Say: Axomys, Lichtenstein; Diplostoma, Rafinesque. The Beavers (Castor, Linnæus). Myopotamus, Commerson. The Porcupines (Hystrix, Linnæus, including the Ursons, Erétisons of F. Cuv., and the Coendous, Synetheres of F. Cuv.). The Hares (Lepus, Linnæus, including Lagomys, Cuvier). The Capybara, Hydrochœrus, Erxleben. The Guinea Pigs (Anœma, F. Cuv., Cavia, Illiger, including Keradon, F. Cuv.). The Agoutis (Chloromys, F. Cuv., Dasyprocta, Illiger). The Pacas (Cœlogenys, F. Cuv.); and the Chinchillas.

Order VI. *Edentata.* Tribe 1. Tardigrades. The Sloths[*] (Bradypus, Linnæus, including Acheus, F. Cuv.). Tribe 2. Ordinary Edentata. The Armadillos (Dasypus, Linnæus), and the subgenus Chlamyphorus, Harlan. The Aard-Vark (Orycteropus, Geoffroy). The Ant-Eaters (Myrmecophaga, Linnæus). The Pangolins (Manis, Linnæus). Tribe 3. The Monotremes. The Echidna, Cuv. (Tachyglossus, Illiger), and the Ornithorhynchus, Blumen. (Platypus, Shaw.).

Order VII. *Pachydermata.* Family 1. Proboscidians. Elephants (Elephas, Linnæus) and Mastodons[†] (Mastodon, Cuvier). Family 2. Ordinary Pachydermata. Hippopotamus (Linn.). The Hogs (Sus, Linnæus, including Phascochœres, F. Cuvier, and Dicotyles, Cuv.). Anoplotherium (Cuv., extinct). The Rhinoceroses (Rhinoceros, Linnæus). The Damans (Hyrax, Hermann). Palæotherium (Cuv., extinct). Lophiodon (Cuv., extinct). The Tapirs (Tapir, Linnæus). Family 3. Solipeda. The Horses, &c. (Equus, Linn.).

Order VIII. *Ruminantia* (Pecora, Linnæus). *No Horns.* The Camels (Camelus, Linnæus, including the Llamas, Auchenia, Illiger). The Musks (Moschus, Linnæus). * * *True Horns shed periodically.* The Stags or Deer (Cervus, Linnæus). * * * *Persistent Horns.* The Giraffe (Camelopardalis, Linnæus). * * * * *Hollow Horns.* The Antelopes (Antilope). The Goats (Capra, Linnæus). The Sheep (Ovis, Linnæus). The Oxen (Bos, Linnæus).

Order IX. *Cetacea.* Family 1. Herbivorous Cetacea. The Manatees (Manatus, Cuvier). The Dugongs (Halicore, Illiger). Rytina (Illiger). Family 2. Ordinary Cetacea. The Dolphins (Delphinus, Linn., including Delphinus, Cuvier, Delphinorhynchus, Blainville). The Porpoises (Phocæna, Cuv.). Delphinapterus, Lacépède, Hyperoodon, Lacépède. The Narwhals (Monodon, Linnæus). The Cachalots (Physeter, Linnæus). The Whalebone Whales (Balæna, Linnæus, including Balæneptera, Lacépède).

Illiger (1811), in his 'Prodromus Systematis Mammalium et Avium,' divided the Mammalia into fourteen orders, thirty-nine families, and one hundred and twenty-five genera, most of which last are characterised with great neatness. We have only room for a mere sketch of this system, which has considerable merit.

Order I. *Erecta* (Man).

Order II. *Pollicata.* Family 2. Quadrumana (Apes and Monkeys). Family 3. Prosimia (the Lemurs, &c.) Family 4. Macrotarsi (Tarsiers, Galago, &c.). Family 5. Leptodactyle (Cheiromys). Family 6. Marsupialia (except the Potoroos and Kangaroos).

Order III. *Sulientia.* Family 7. Salientia (Hypsiprymnus and Halmaturus, Potoroos and Kangaroos).

Order IV. *Prensiculantia.* Fam. 8. Macropoda (Jerboas, &c.). Fam. 9. Agilia (Myoxus, the Squirrels, and Pteromys). Fam. 10. Murina (Marmots, Hamsters, Rats, &c.). Fam. 11. Cunicularia (Lemmings, Hypudæus, &c.). Fam. 12. Palmipeda (Hydromys and Beavers). Fam. 13. Aculeatea (Porcupines and Loncheres, or Echimys). Fam. 14. Duplicidentata (Hares, &c.). Fam. 15. Subungulata (Paca, Agoutis, Guinea Pigs, Capybara).

Order V. *Multungulata.* Fam. 16. Lamnungia (Hyrax, &c.). Fam. 17. Proboscidea (Elephants). Fam. 18. Nasicornia (Rhinoceroses). Fam. 19. Obesa (Hippopotamus). Fam. 20. Nasuta (Tapirs). Fam. 21. Setigera (Hogs).

Order VI. *Solidungula.* Fam. 22. (Horse, &c.)

Order VII. *Bisulca.* Fam. 23. Tylopoda (Camels and Llamas). Fam. 24. Devexa (Giraffe). Fam. 25. Capreoli (Deer and Musks). Fam. 26. Cavicornia (Antelopes, Goats, and Oxen).

Order VIII. *Tardigrada.* Fam. 27. Tardigrada (Sloths, tridactylous and bidactylous, Sloth-Bear or Prochilus).

Order IX. *Effodientia.* Fam. 28. Cingulata (Armadillos). Fam. 29. Vermilinguia (Aard-Vark, Ant-Eaters and Pangolins).

Order X. *Reptantia.* Fam. 30. Reptantia (Monotremes and Pamphractus, which last is no mammal, but a tortoise).

Order XI. *Volitantia.* Fam. 31. Dermoptera (Galeopithecus). Fam. 32. Cheiroptera (Bats).

Order XII. *Falculata.* Fam. 33. Subterranea (Hedgehogs, Shrews, Moles, &c.). Fam. 34. Plantigrada (Kinkajou, Coatis, Raccoon, Glutton, Badgers, and Bears). Fam. 35. Sanguinaria (Fennec, Dogs, Hyænas, Cats, Civets, and Suricate). Fam. 36. Gracilia (Ichneumons, Skunks, Weasels, Otters).

Order XIII. *Pinnipedia.* Fam. 37. Pinnipedia (Seals and Walruses).

Order XIV. *Natantia.* Fam. 38. Sirenia (Manatee, Dugong, and Rytina). Fam. 39. Cete (Whalebone Whales, Narwhals, Cachalots, Dolphins, &c.).

M. de Blainville (1816) divided the *Mammifêres* into two subclasses. 1. The *Monodelphes*, containing the six orders Quadrumana, Carnassiers, Edentata, Rodentia, Gravigrades, and Ongulogrades. 2. The *Didelphes.* All the orders of the *Monodelphes*, with the exception of the fourth and fifth, are subdivided into the *Normal* and *Anomalous*, and so is the subclass of Didelphes, the Normal forms being the *Carnassiers* and *Rongeurs*, and the Anomalous *Echidna* (for burrowing) and *Ornithorhynchus* (for swimming). M. de Blainville observes that it may be that the *Cetacea* should form a separate order or degree of organization; and that the *Echidnæ* and *Ornithorhynchi* may make a distinct subclass.

In 1825 Mr. Gray published his 'Outline of an Attempt at the Disposition of Mammalia into Tribes and Families, with a List of the Genera apparently appertaining to each Tribe.' For the details we must refer the reader to the 'Annals of Philosophy' (vol. xxvi.), confining ourselves to a mere sketch of the orders, families, and subfamilies.

§ 1. Teeth of the three distinct sorts, and forming a continuous series.

Order I. Primates (Linn.).

*

Anthropomorphous.

Family 1. *Hominidæ.* Subfamilies: 1. Hominina (Man). 2. Simiina (Apes). 3. Presbytina (Presbytes). 4. Cercopithecina (Cercopithecus, &c.). 5. Cynocephalina (Cynocephalus and Papio).

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[*] It is here that Cuvier mentions the extinct genera Megatherium and Megalonyx, noticing however the differences, and observing that the former, though it has a skull very like the sloths, wants the canines, and inclines, as to the rest of the skeleton, partly to the sloths, and partly to the ant-eaters.

[†] Extinct.

Fam. 2. *Sariguidæ.* Subfam. 1. Mycetina (Mycetes). 2. Atelina (Ateles, &c.). 3. Callithricina (Cebus). 4. Saguinina (Saguinus, &c.). 5. Harpalina* (Jacchus and Midas).

* * Quadrupedoid.

Fam. 3. *Lemuridæ.* Subfam. 1. Lemurina (Lemur). 2. Lichanotina (Indris, Lichanotus). 3. Loridina (Loris, Nycticebus). 4. Galagonina (Otolicnus, &c.). 5. Tarsina (Tarsius). 6. Cheiromina (Cheiromys).

Fam. 4. *Galeopithecidæ.* Galeopithecus.

Fam. 5. *Vespertilionidæ.* Subfam. 1. Rhinolophina (Megaderma, &c.). 2. Phyllostomina (Phyllostomus, &c.). 3. Pteropina (Pteropus, &c.). 4. Noctilionina (Noctilio, &c.). 5. Vespertilionina (Vespertilio, Barbastellus, &c.).

Order II. Feræ (Linn.).

* Cutting-teeth six above and below; grinders of three sorts.

Fam. 1. *Felidæ.* Subfam. 1. Hyænina (Hyæna and Proteles). 2. Felina (Felis, Lyncus, Prionodon). 3. Mustelina (Putorius, &c., and Lutra). 4. Viverrina (Viverra, &c.). 5. Canina (Canis, Fennecus, Lycaon).

Fam. 2. *Ursidæ.* Subfam. 1. Ursina (Ursus, &c.). 2. Procyonina (Procyon, &c.). 3. Gulonina (Gulo, &c.). 4. Myadina † (Myadus). 5. Taxina (Meles).

* * Cutting-teeth various (rarely six above and below); grinders of two sorts, false and tubercular.

Fam. 3. *Talpidæ.* Subfam. 1. Talpina (Talpa). 2. Chrysochlorina (Condylura, &c.). 3. Soricina (Sorex, Mygale). 4. Erinacina (Erinaceus). 5. Tenrecina (Tenrecus). 6 ? Tupaina (Tupaia).

Fam. 4. *Didelphidæ.* Subfam. 1. Macropina (Macropus, &c.). 2. Phalangistina (Acrobata, Petaurus, &c.). 3. Phascolomina (Phascolomys). 4. Didelphina (Didelphis, Cheironectes). 5. Dasyurina (Peracyon, Dasyurus, Phascogale). 6. Peramelina (Perameles and Isodon).

Fam. 5. *Phocidæ.* Subfam. 1. Stenorhyncina (Pelagios, Stenorhynchus). 2. Phocina (Phoca). 3. Enhydrina (Enhydra). 4. Otariina (Otaria, Platyrhynchus). 5. Stemmotopina (Stemmotopus and Macrorhinus).

§ 2. Teeth not of three sorts, or not forming a continuous series.

Order III. Cete (Linn.).

* Skin smooth without any hair or whiskers.

Fam. 1. *Balænidæ.* Subfam. 1. Balænina (Balæna, Balænoptera). 2. Physeterina (Physalus, Physeta, Catodon).

Fam. 2. *Delphinidæ.* Subfam. 1. Delphinina (Delphinus, Delphinorhynchus). 2. Phocænina (Phocæua, &c.).

* * Skin rather hairy, whiskers distinct; grinders flat-topped.

Fam. 3. *Trichecidæ.* Trichecus.

Fam. 4. *Manatidæ.* Manatus.

Fam. 5. *Halicoridæ.* Halicora, Stellerus.

Order IV. Glires (Linn.).

* Fur with scattered larger hairs or spines; tail spiny or scaly.

Fam. 1. *Muridæ.* Subfam. 1. Murina (Mus, &c.). 2. Hydremina (Hydromys). 3. Ondatrina (Ondatra). 4. Castorina (Castor, Osteopora). 5. Echymina (Echymys, &c.).

Fam. 2. *Histricidæ.* Hystrix, &c.

* * Fur nearly equally soft; tail none, or hairy.

Fam. 3. *Leporidæ.* Subfam. 1. Leporina (Lepus). 2. Lagomina (Lagomys). 3. Caviina (Cavia, Kerodon). 4. Hydrochærina (Hydrochærus). 5. Dasyporcina (Cælogenys, &c.).

Fam. 4. *Jerboidæ.* Subfam. 1. Pedestina (Pedestes). 2. Dipina (Dipus, Meriones (F. Cuv., not Illiger). 3. Gerbillina (Gerbillus). 4. Myoxina (Myoxus). 5. Sciurina (Sciuropterus, Sciurus, &c.).

Fam. 5. *Aspalacidæ.* Subfam. 1. Aspalacina (Orycterus, &c.). 2. Lemmina (Arvicola, Lemmus, &c.). 3. Cricetina (Cricetus). 4. Pseudostomina (Pseudostoma, &c.). 5. Arctomina (Arctomys, Spermophilus).

Order V. Ungulata (Ray). Bruta, Pecora, Belluæ (Linn.).

* Two middle toes large, equal; bones of the metacarpus and metatarsus united.

Fam. 1. *Bovidæ.* (Horns persistent.) Subfam. 1. Bovina (Bos, Ovis, Capra, Antilocapra, Antilope, Catoblepas). 2. Camelopardina (Camelopardalis). (Horns none, or deciduous.) 3. Camelina (Camelus and Auchenia). 4. Moschina (Moschus and Memina). 5. Cervina (Cervus, Muntjaccus, &c.).

Fam. 2. *Equidæ.* Equus (Linn.). Asinus (Gray).

* * Toes three, four, or five to each foot, nearly equal; teeth nearly in one series.

Fam. 3. *Elephantidæ.* (Nose extended into a trunk.) Subfam. 1. Elephantina (Elephas, Mastodon). 2. Tapirina (Tapirus, Lophiodon, Palæotherium). (Nose not produced into a trunk.) 3. Rhinocerina (Rhinoceros, Hyrax, Lipura and Elasmotherium, Anoplotherium, &c.). 4. Suina (Sus, &c.). 5. Hippopotamina (Hippopotamus).

Fam. 4. *Dasypidæ.* (Body covered with scales and armour, revolute.) Subfam. 1. Manina (Manis, Dasypus, &c.). (Body hairy or spinous, not convolute.) 3. Orycteropina (Orycteropus). 4. Myrmecophagina (Myrmecophagus, &c.). 5. Ornithorhynchina (Echidna, Ornithorhynchus).

Fam. 5. *Bradypidæ.* Bradypus, Cholæpus, Megatherium, Megalonyx.

Mr. Gray then exhibits the manner in which the orders appear to be connected together, and the 'Typical' and 'Annectant Groups' of each order.

Mr. Swainson, who does not admit Man into the zoological circle for reasons stated in his 'Natural History and Classification of Quadrupeds' (1836), gives in the third part of his book an arrangement of 'The Class Mammalia, according to its natural affinities.' He makes the *Quadrumana*, the first order, consist of the following families:—1, Simiadæ. 2, Cebidæ. 3, Lemuridæ. 4, Vespertilionidæ, consisting of Mr. Gray's subfamilies Rhinolophina, Phyllostomina, Pteropina, Noctilionina, and Vespertilionina.

The second order, *Feræ*, includes the families—1, Felidæ. 2, Mustelidæ, consisting of the subfamilies Viverinæ (Viverrinæ), Mustelinæ, and Ursinæ. 2, Didelphidæ (Opossums). 3, Sorecidæ. 4, Phocidæ.

The third order, *Cetacea*, comprehends the families—1, Sirenia (Herbivorous Cetacea). 2, Cete, with the subfamilies? Delphinæ and Balæninæ.

The fourth order, *Ungulata*, embraces—tribe 1, Pachydermes. Tribe 2, Anoplotheres. Tribe 3, Edentates, including the Monotremes. Tribe 4, Ruminantes (comprehending the families—1, Bovidæ. 2, Antilopidæ. 3, Cervidæ. 4, Moschidæ. 5, Camelopardæ). Tribe 5, Solipedes.

The fifth order, *Glires*, consists of—division 1, Glires proper, with clavicles. Div. 2, Clavicles rudimentary or none.

Immediately following the genus Cavia and its subgenera we find the '*Marsupial* Rodentia. Situation uncertain;' and next to them the family 'Marsupidæ' (Herbivorous Marsupials), formed of the genera Halmaturus, Hypsiprymnus, and Phalangista, the latter with two subgenera, Petaurista and Petaurus.

We must refer the reader to Mr. Swainson's book for an explanation of the peculiar views of classification, affinity, and analogy developed in it.

The works of Buffon can hardly be said to present any principle of classification as applicable to the Mammalia. Pennant indeed gives what he calls a systematic index of the genera, species, and varieties, and divides the Quadrupeds into two grand divisions (the first without a name, and including—1, Horse; 2, Ox; 3, Sheep; 4, Goat; 5, Giraffe; 6, Antelope; 7, Deer; 8, Musk; 9, Camel; 10, Hog; 11, Rhinoceros; 12, Hippopotame; 13, Tapiir; 14, Elephant, as generic appellations; and the second grand division, with the name of Digitated Quadrupeds, including the genera (Section 1)—15, Ape; 16, Macauco; (Section 2)—17, Dog; 18, Hyæna; 19, Cat; 20, Bear; 21, Badger; 22, Opossum; 23, Weasel; 24, Otter; (Section 3)—25, Cavy; 26, Hare; 27, Beaver; 28, Porcupine; 29, Marmot; 30, Squirrel; 31, Jerboa; 32, Rat; 33, Shrew; 34, Mole; 35, Hedgehog; 36, Sloth; 37, Armadillo; 38, Manis; 39, Ant-Eater; 40, Walrus; 41, Seal; 42, Manati; 43, Bat); but this catalogue can hardly be called systematic. In his later editions he formed his catalogue into a more complete 'Method,' with four grand divisions:—1, Hoofed Quadrupeds; 2 Digitated; 3, Pinnated; 4, Winged; but his work will always be consulted more for the natural history of the 'Quadrupeds' there treated of, than for their arrangement.

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* Hapalina ?

† Mydaina ? Mydaus ?

We can only allude to the works of Pallas, Allamand, Schreber, Shaw, Marcgrave, Catesby, Hernandez, D'Azara, Sonnerat, Steller, Sparrman, Le Vaillant, Bruce, Barrow, Burchell, Humboldt, Peron, Lesueur, Fischer, Lesson, Rüppell, Smith, Bennett, Bell, Owen, Ogilby, Sykes, Darwin, and a host of others, who have enriched the subject by their writings or the observations which they have made in their travels.

MAMMARY GLAND is an organ of considerable interest from its occurring only in that important class of animals to which it gives its name [Mammalia], and whose greatest peculiarity is that, while young, their food is the milk secreted by the mammary gland of their mother.

The number of mammary glands varies in different animals. They are composed of ramified ducts which open on the surface of a nipple or teat by a very minute orifice. In some animals, as ruminants, there is but one orifice at the extremity of each nipple; in others, and in man, there are several. Each orifice leads into a fine canal, which however soon dilates, and ramifies with irregular and tortuous branches in the substance of the breast or udder. Each branch has either a simple closed extremity or terminates in a minute cellule, and numerous capillary blood-vessels ramify on their walls and secrete the milk into them. When the mouth of the young animal, by the action of sucking, produces a partial vacuum over the nipple, the weight of the surrounding medium presses lightly and equally upon the surface of the breast or udder, and propels the milk from the ducts in minute and gentle streams.

At the commencement of pregnancy, the mammary gland, which up to the period of puberty had been but little developed, enlarges; its increase of size keeps pace with the progress of gestation, and before its termination a thin serous milky fluid begins to be secreted. Directly after parturition, the quantity of milk increases, and it becomes more thick and rich, combining in itself all the best principles for the nourishment of the young animal. It continues to flow for a length of time proportioned to the age at which the young animal can seek its own food, and then gradually subsiding, the gland decreases to the same size which it had before pregnancy.

In women the mammary gland is subject to many and severe diseases; as abscess, cancer, and various tumours; but the consideration of these belongs to other general articles. In males of all species only a rudiment of this organ is found; yet there are not wanting instances in which milk has been secreted from the breasts of men and other male animals. (Blumenbach.)

MAMMEA, a genus of the natural family of Guttiferæ, so called from the American name *Mamey* of *M. Americana*, or the American Mammee-tree, which is the only species of this genus, and forms a handsome tree with a spreading elegant head, which is compared with that of a Magnolia. The flowers are odoriferous and employed as an aromatic addition to liqueurs called *Eau* and *Crême des Creoles* in some of the West India Islands. The fruit is large and has a double rind, of which the outer is thick and leathery; the inner one is thin and bitter, and contains the pulp closely adhering to it, which is of a yellow-apricot colour, whence it is sometimes called abricot de Saint Domingue. This pulp has a pleasant but peculiar taste with an aromatic smell; it may be eaten raw, or cut in slices with wine or sugar; or cooked, which deprives it of its gummy portion. It is also preserved in wine sweetened with sugar, or in brandy. (Labat.) The fruit is considered nourishing and pectoral, and much esteemed in America. Attempts have been made to cultivate it in stoves in this country. According to Sweet, it grows freely in sandy loam; and ripened cuttings, with the leaves not shortened, root in sand under a hand-glass in heat.

MAMMELLI'PORA. Bronn chooses this name instead of Lymnorea, Lam., for a genus of fossil zoophyta, analogous to Alcyonium.

MAMMOTH, a term employed to designate the fossil elephants. The name has been erroneously applied sometimes to the Mastodon. [Elephant, vol. ix., p. 352.]

MAMUN, ABUL ABBAS ABDALLAH, the seventh Abbaside caliph, was born at Bagdad, A.D. 786. He was entrusted, during the life of his father, the celebrated Harun al Rashid, with the government of Khorassan; but on the death of Al Rashid, in 808, and the succession of his brother Amin, Mamun was deprived of this government, and commanded to repair to Bagdad. But as such a step would doubtless have been followed by his death, Mamun disobeyed the orders of the caliph, and proclaimed war against him. The contest was carried on till 813; when Bagdad was taken by Thaher and Harthemah, the general of Mamun, and Amin put to death.

The early part of Mamun's reign was greatly disturbed by the pretensions of the descendants of Ali, the cousin of Mohammed. [Ali.] Mamun, in order to restore peace to his empire, named one of the princes of the house of Ali as his successor, and commanded that the black colour, which distinguished the Abbasides, should be discontinued at the court, and replaced by the green, which was worn by the descendants of the prophet. This step however occasioned a revolution in the government; the Abbasides rose against their caliph and proclaimed in his stead Ibrahim, the son of Mahadi. After the end of two years, Mamun obtained the caliphate again, and, taught by experience, restored the black colour of the Abbasides and named his brother as his successor. The partisans of the Alides again rebelled against Mamun, but were unable to obtain any advantages over him. In addition to these wars, Mamun was also engaged, during part of his reign, by the revolt of the son of Harthemah in Armenia, and by that of Thaher in Persia.

In 830 Mamun engaged in a war with Theophilus, the emperor of Constantinople; which is said to have arisen from the refusal of the emperor to allow Leon, a celebrated teacher at Constantinople, to repair to Bagdad, whither he had been invited by the caliph. The war was carried on, principally in Cilicia, during three successive campaigns; at the close of which Mamun died in the vicinity of Tarsus, 833, and was succeeded by his brother Motasem.

Although the reign of Mamun was disturbed by so many wars and intestine commotions, yet science and literature were more extensively cultivated than under any preceding caliph. Mamun was a munificent patron of literature; he founded colleges and libraries in the principal towns of his dominions; and invited to his court not only Greek and Syriac, but also Hindu philosophers and mathematicians. Many of the most celebrated Greek and Hindu works were translated into Arabic by his command; and among other works written during this time, we may mention an 'Elementary Treatise on Algebra,' by Mohammed ben Musa, which was published with a translation by the late Dr. Rosen. [Abbasides.]

MAN. The anatomy and physiology of man are treated of under their several and appropriate heads in this work. The present article is limited to the consideration of Man as an object of natural history. The subject may be divided into two parts: 1, The comparison of the human structure and economy with those of other animals; and 2, The comparison of the various modifications of the human structure and economy in different races of men.

Specific Characters of Man.—In every part of the human frame we find adaptations to the erect attitude, the most peculiar characteristic of mankind. Examining the skeleton, we find that the two condyles, or articulating surfaces of the occiput, by which the skull is connected with the spine, are so placed on each side, that a vertical line passing through the centre of gravity of the head would fall almost exactly between them and on the top of the spine. The condyles are not placed at the very centre of the base of the skull, but just behind it, so as to compensate in some measure for the greater specific gravity of the posterior part of the head, which is composed chiefly of thick heavy bone and brain, while the anterior is formed in part by the light bones of the face, and contains numerous cavities. Still however there is a slight preponderance in front of the condyles, which, when the head is not held up by some external force, tends to carry it forwards and downwards, as we may see in persons falling asleep in the erect posture. But the muscles attached to the back of the head are far larger and more numerous, as well as more conveniently arranged for the full exercise of their power, than those in front of the condyles, and the effort required of them to hold up the head is so slight, that it may be made throughout the day without producing fatigue.

The surfaces of these condyles moreover have a horizontal direction (when the head is held upright), and thus the weight of the skull falls vertically upon them and the top of the vertebral column. Comparing with these arrangements the position and direction of the occipital condyles in other mammalia, we find that in the latter they are placed much nearer the back of the head, and that their plane is more oblique. Thus, if a line be drawn in the median plane along the base of a human skull, the foramen magnum and occipital condyles will be found immediately behind the point at which that line is bisected; while in the chimpanzee (in which also the condyles are proportionally smaller) the same parts are placed in the middle of the posterior third of a line similarly drawn, and in other animals are still farther back. Hence there is in all animals a greater proportion of the weight of the head in front of the vertebral column than there is in man; and all the parts anterior to the condyles are proportionally shorter in man than in other mammalia, in which the jaws, the bony palate, the basilar part of the occipital bone, and the petrous portions of the temporal, are always long and large.

Besides being placed so far behind the centre of gravity of the head, the condyles of other mammalia are directed more obliquely downwards than those of man; so that, if the head were supported on the top of a vertical column, its weight (even if it fell entirely upon the condyles) would press on an inclined plane, and constantly tend to carry the head forwards and downwards. The degree of obliquity in the direction of the condyles varies in different animals. It may be nearly estimated by the angle formed by two lines, one of which is drawn in the plane of the occipital foramen, and the other from its posterior edge to the lower margin of the orbit. This angle is of 3° in man, and of 37° in the orang-outan; but in the horse it is 90°, the plane of the foramen being vertical. If therefore the natural posture of man were horizontal, he would in this respect be circumstanced like the horse, for the plane of his condyles, which is nearly horizontal in the upright position, would then be vertical; the head, instead of being nearly balanced on the top of the column, would hang at the end of the neck, and its whole weight would have to be supported by some external and constantly-acting power. But for this there is neither in the skeleton nor in the muscular system of man any adequate provision. In other mammalia the head is maintained in such a position by a strong and thick ligament (the ligamentum nuchæ), which passes from the spines of the cervical and dorsal vertebræ to the most prominent part of the occiput, but of which in man there is little or no trace. In the horizontal position therefore he would have the heaviest head, with the least power of supporting it.

The position of the face immediately beneath the brain, so that its front is nearly in the same plane as the forehead, is peculiarly characteristic of man; for the crania of the chimpanzee and orang, which approach nearest to that of man, are altogether posterior to and not above the face. This form, at the same time that it remarkably distinguishes the human from the brute features, is exactly adapted to the erect attitude. In that posture the plane of the orbits is nearly horizontal; the cavities of the nose are in the best direction for inhaling odours, proceeding from before or from below them; the jaws do not project in front of the forehead and chin. But suppose the posture changed, as painful an effort would be required to examine an object in front of the body as is now necessary to keep the eyes fixed on the zenith, and the heavens would be almost hidden from our view; the nose would be unable to perceive any other odours than those which proceeded from the earth or from the body itself; and the teeth and lips would be almost useless, for they would scarcely touch an object on the ground before the forehead and chin were in contact with it; while the view of that which they attempted to seize would be obscured by the nose and cheeks.

The vertebral column in man, though not absolutely straight, yet has its curves so arranged, that when the body is in the erect posture, a vertical line drawn from its summit would fall exactly on the centre of its base. It increases in size in the lumbar region, and is therefore somewhat pyramidal in form. The lumbar portion of the human vertebral column is also of considerable length, and is composed of five vertebræ; while in the chimpanzee and orang there are but four. The processes for the attachment of muscles upon it are long and strong; an arrangement well adapted to overcome the tendency which the weight of the viscera in front of the column has to draw it forwards and downwards. Thus the spinous processes of the cervical and dorsal vertebræ, which are in other mammalia large and strong for the attachment of the ligamentum nuchæ to support the head, are in man scarcely prominent, and his head is nearly balanced on the vertebral column; while those of the lumbar vertebræ, by which the weight of the thoracic and abdominal viscera is partly supported, are proportionally much larger in man than in other mammalia.

The base of the human vertebral column is placed on a sacrum of greater proportional breadth than that of any other animal, and remarkably arched forwards. The sacrum is again fixed between two widely-expanded haunch-bones, forming the lateral walls of a peculiarly broad pelvis. By its great width the pelvis forms an ample cavity for the support and defence of many of the viscera, and especially of the pregnant uterus: by the distant separation of the haunches and thighs the basis of support is rendered wider, and by its oblique direction the weight of the body is transmitted more directly from the sacrum to the upper part of the thigh-bones. The pelvis of every other species of the class is very different from the human; it is always longer and narrower, having a far smaller space between the iliac bones and the lowest ribs; the sacrum especially is lengthened and reduced in width; the alæ of the ilia are much less expanded; and the whole pelvis, instead of forming an angle with the vertebral column, is almost in the same line with it.

The lower extremities of man are remarkable for their length, which is proportionally greater than that of any other mammal, except those of the kangaroo tribe. Now it is evident that no greater obstacle to progression in the horizontal posture could exist than this length of what would then be the hind legs. Either man would be obliged to rest on his knees, with his thighs so bent towards the trunk, that an attempt to advance them would be painful, and with his legs and feet immovable and useless; or he must elevate his trunk upon the extremities of his toes, throwing his head downwards, and exerting himself forcibly at every attempt to bring forward the thighs by a rotatory motion at the hip-joint. In either case the only useful joint would be that at the hip, and the legs would be scarcely superior to wooden or other rigid supports.

The position of the human thigh-bone, in which it is most securely fixed in its deep acetabulum, is that which it has when supporting the body in the erect attitude. In the chimpanzee and orang-outan its analogous position is at an oblique angle to the long axis of the pelvis, with the body supported obliquely in front of it: in other animals, as the elephant, it forms nearly a right angle; and in others, as the horse, ox, &c., an acute angle with the axis of the pelvis and spinal column. The human femur is further distinguished by its great length, by the obliquity and length of its neck, and by its being directed somewhat obliquely inwards towards that of the opposite side, so as to approximate the knees and bring them more directly under the pelvis. It is by this great length of the thigh that the proportion in the length of the human thigh and arm is so different from that which obtains in the apes, among which, in the chimpanzee, the arms reach to the level of the knees, and in the orang-outan to the ancles; while in man they extend only to the middle of the thighs. In all other animals the thigh is still shorter.

In the human knee-joint we find the opposed extremities of the femur and tibia expanded so as to present a very broad articulating surface; and the internal condyle of the femur lengthened, so that the whole weight of the body, when erect, falls vertically on the top of the tibia, when the joint is in the firmest position in which it can be placed.

The weight of the body is next transmitted through the tibia to the upper convex surface of the astragalus, and thence to the other bones of the foot.

The human foot is, in proportion to the size of the whole body, larger, broader, and stronger than that of any other mammal. In the upright position it is at right angles with the leg, and is in contact with the ground at both ends. The sole of the foot is concave, so that the weight of the body falls on the summit of an arch, of which the astragalus (supported below by a very strong ligament), represents the key-stone, and of which the principal points of support are the large and arched os calcis, and the anterior extremities of the metatarsal bones. This strength and size of his foot enable man alone of all mammalia to stand upon one leg. The natural contact of the os calcis with the ground, and its arched form, are also peculiar to him. All the apes have the os calcis small, straight, and more or less raised from the ground, which, when standing, they touch only with the outer side of the rest of the foot; while in animals more remote from man the angle which the os calcis forms with the tibia is still more acute; and the foot being more elongated and narrow, the extremities of the toes only come in contact with the ground. The foot of the monkey is still further distinguished from that of man by the great length of four of its toes, and the separation of the most internal (which, instead of being the largest, is the smallest) from the rest, in such a manner that it can be opposed to them in action, like a thumb. Monkeys are hence four-handed, all their extremities being alike adapted for prehension, and for clinging to small bodies, as the branches of trees, &c.

Man's chest is large and expanded. It is flattened in front, and has greater dimensions transversely than in depth, a peculiarity in which only the most man-like monkeys partake. The sternum is short and broad, and there is a considerable distance between the lower ribs and the haunch-bones, in consequence of the small number of ribs and the length of the lumbar portion of the vertebral column. The viscera in this space, which in the horizontal position would be but insufficiently held up by the abdominal muscles, are in the erect attitude securely supported by the expanded pelvis.

In the upper or anterior extremity of man we find ample proofs of his naturally erect attitude, though some of them are only of a negative kind, as those drawn from the total unfitness of the arm and hand to be an organ of support; and others only presumptive, as those relating to the necessity of the upright posture for the full exercise of the hands. But the peculiarities of the upper extremity of man, in relation to his being the only two-handed animal, are sufficiently interesting to require a separate description.

The other parts of the human body concerned in locomotion are in exact adaptation with the peculiar construction of the skeleton. The superior power of the muscles, tending to draw the head and spine backwards, has been already referred to; the glutei, by which the pelvis is fixed on the thighs, and by which the principal outward motions of the legs are performed, are very large, forming the buttocks, which are peculiar to man; the extensors of the legs are more powerful than the flexors, an arrangement which is the reverse of that of other animals; the gastrocnemii, from which such powerful exertions are constantly required to raise the whole weight of the body by drawing up the heel, as in walking, jumping, &c., form a large mass, the calf, which, like the buttock, is found in no other animal; the flexor longus pollicis muscle is attached only to the great toe, on which the weight of the body is so often supported; while in the chimpanzee and orang, which, in so many other respects resemble the human form, it is affixed to the three middle toes; the serratus magnus, which, like a sling between the scapulæ, supports the front of the trunk of quadrupeds, is proportionally small in man.

In the preceding observations, at the same time that the peculiarities of the human skeleton have been pointed out, sufficient evidence has probably been adduced to prove that the erect attitude is that to which the structure of man, but of no other mammal, is best adapted. Yet some have argued the contrary from the histories and fables of some supposed wild men, who, it has been said, were found in woods, dumb, hairy, and crawling on all-fours, and who have been considered as specimens of man, unaltered by civilisation, in a state of original nature. (See the histories of Peter the Wild Boy and others in Blumenbach's *Beyträge zur Naturgeschichte*; Monboddo's *Antient Metaphysics*, &c.) It is sufficient to say that in the very few cases of the kind for which there is any authority, it has been clearly proved that they were merely idiotic or otherwise deficient children, who had been lost or exposed by their parents; and that the authors who state them to have been either quadruped or hairy are altogether unworthy of credit. But while this class of writers has seemed anxious to reduce man to the station of the apes, another has endeavoured to prove that there are some of the monkey tribe who are habitually biped. The allusions already made to the structure of their skeleton (which has been most fully illustrated by Mr. Owen in the 'Zool. Trans.' vol. i.) will have rendered this extremely improbable; and it is now perfectly certain, from repeated observation, that the gesture of even those orangs who are most man-like is never agile or easy unless they employ all their limbs to support them. The attempts of other animals, as dogs, bears, &c., who are taught to assume the erect posture, are even more constrained than those of the monkeys.

Man alone is two-handed. 'That,' says Cuvier (*Regne Animal*, i. 78), 'which constitutes the *hand*, properly so called, is the faculty of opposing the thumb to the other fingers to seize the most minute objects, a faculty which is carried to its highest degree of perfection in man, in whom the whole anterior extremity is free, and can be employed in prehension.' Hands thus defined occur only in man and in monkeys; the former is therefore made to constitute a separate order, 'Bimanous,' and the latter are included in a second order, as quadrumanous, or four-handed.

Although formed on the same general plan as the anterior extremity of all vertebrated animals, the structure of the human hand is so much more complicated than theirs, and adapted to so many more intricate offices, that Sir C. Bell (*Bridgewater Treatise*, p. 18) has said, 'We ought to define the hand as belonging exclusively to man.' Its perfection as an organ of prehension is due partly to its own construction, and partly to the form of the parts with which it is connected, for 'the whole frame must conform to the hand, and act with reference to it.' The erect attitude, for example, which has been proved to be that which is natural to man, is necessary to its full action, and to that wide range of motion which it receives from the arm, and which is the main object in the construction of all the parts by which the hand is connected with the trunk. And in like manner it could be proved that more remotely the peculiarities of the organs of sensation, of digestion, and of other functions are adapted to the hands.

By a powerful collar-bone, which keeps the shoulder and arm apart from the chest, man obtains, in common with all the animals which have much power in digging, flying, or climbing, as moles, bats, squirrels, &c., a powerful lateral and inward motion of the arm, and a wider range for action beyond the body. His scapula, or shoulder-bone, is strong and broad, and has a prominent spine and acromion, to which muscles are attached, while its glenoid cavity, being directed outwards, and maintained there by the clavicle, leaves all the outward motions of the arm perfectly free from hindrance. In the same degree the hemispherical head of the humerus loosely adapted to the shallow glenoid cavity, its long and light shaft, and its flattened tuberosities, all combine to produce a freedom of motion in the upper arm, which, were it used as an organ of support, could not exist without danger of injury, but which are essential to the wide range within which it is necessary that the hand should act. The only motions of the fore-arm upon the upper arm are those of flexion and extension; by the former the hand can be brought within, and by the latter carried beyond the range of motion of which the upper arm alone is capable. The bones of the fore-arm itself are so articulated that one may rotate on the other in any position of the arm; the bone, which in this rotation is fixed, being that by which the hinge-joint of the elbow is formed, while that which rolls over it is articulated by another hinge-joint with the wrist and hand. Thus then were the hand itself powerless, there would be in the other bones and joints of the upper extremity provisions for moving it through the greater part of a sphere whose radius is equal to the length of the arm, for bringing it to any point in that sphere, and for moving it in any direction at that point.

The perfection of the structure of the hand itself is chiefly due to the size and strength of the thumb, by which its superiority over the hands of monkeys (who enjoy a freedom of motion of the arm equal to that which man possesses) is also chiefly produced. From its size and strength the thumb of the human hand can be brought into exact and powerful opposition to the extremities of the fingers, which are all moreover, separately moveable, and can each in its turn, or altogether, be employed in association with the thumb. The least consideration will show how numerous are the actions in which this easy and exact opposition of the tips of the thumb and of one or more fingers, if not necessary, is at least essential to dexterity. In those monkeys which approach most nearly to man the thumb is so short and weak, and the fingers so long and slender, that their tips can scarcely be brought in opposition, and can never be opposed in near contact with each other with any degree of force. Hence though admirably adapted for clinging round bodies of a certain size, as the small branches of trees, &c., they can neither seize very minute objects, nor support large ones; but the hand of man is adapted for all these and many other purposes.

It is a great peculiarity of man that his hands and feet are so different from each other; and in man alone their uses are totally different. In the monkeys all the extremities are alike formed to be organs of prehension; in the carnivora all are alike organs of prehension and support; in the hoofed animals all are organs of support alone; in man the anterior or upper extremities are entirely for prehension, the posterior, or lower, entirely for support. M. Bory de St. Vincent (art. 'Orang,' *Dict. Cl. d'Hist. Nat.*) indeed thinks that the absence of a prehensile power in the human foot is uncertain, and that the position of the great toe may be changed so as to convert the foot of man into a hand, like that of the monkey. He says there are peasants in the Landes of Aquitaine who are termed *resiniers*, from collecting the resin of the *Pinus maritima*, who acquire a power of opposing the great toe to the others, like a thumb; but it would surely be as incorrect to deduce from the instances of rarely acquired power in these peasants, or in those who are born without hands, and can write or work with their toes, that the human foot is naturally an organ of prehension, as it would to assume that the natural position of the bear is erect, because a few of his species have been taught to assume such a position for a short time. Besides, in those who have been born without hands, and have endeavoured to substitute their feet, the prehension of small bodies has been effected not by opposing the great toe to the others, but by flexing its phalanges firmly against its ball.

With one exception (in the fossil genus Anoplotherium) man is distinguished from all other animals by the equality in length of all his teeth, and by the equally close approximation of them all in each jaw. Even the most anthropomorphous apes (as the chimpanzee and orang-outan) have the canine teeth longer than the others, and an interval in the line of teeth in each side of each jaw, to receive the canine teeth of the opposite jaw. The vertical position of the human teeth, on which one of the most characteristic features of the human face, the prominent chin, depends, is also quite peculiar, and is intimately connected both with his erect attitude, and with the perfection of his hands, by which the divided food is conveyed to the mouth. The intermaxillary bones, in which the upper incisor teeth are developed, have often been described as absent in man alone; but in fact they are only united to the upper maxillary bones at a very early period of the life of the human fœtus. The extent of the palatine portions of these bones is indicated by the position of the foramina incisiva, which in man are united into one hole, which is much nearer to the incisor teeth than in any quadrumanous animal.

The smoothness of his skin and the entire deficiency of all natural arms either of attack or of defence are other peculiarities of the human race. The face and body of the most delicate female are indeed covered with hair, and therefore man must be regarded as a hairy animal; but there is sufficient difference between the fine colourless and downy hair with which the human body generally is beset, and the long silky or woolly hair with which even the smoothest apes are covered, to adopt this as an additional specific character of mankind. Some parts of the human body, on the other hand, are even more hairy than those of other animals, as the scalp, axillæ, &c. In his naturally unarmed condition, destitute of either projecting teeth or strong claws, covered neither with hard scales, nor with bristles, nor with a thick hide, and surpassed in speed by many of his more powerful antagonists, man's condition would seem most pitiable, and inferior to that of any other animal; for on all the rest of those to whom she has denied the weapons of attack, nature has bestowed the means either of defence, or of concealment, or of flight. But man, by his superior reason, has subdued all other animals. His intellect can scarcely suggest the mechanism which his hands cannot frame; and he has made for himself arms more powerful and destructive than any other creature wields; he has clothed himself in armour and built walls of defence with which he can defy the attacks of any but his fellow-men. Naturally unarmed, man has conquered the whole armed creation; some he has driven from their abodes, and almost exterminated; others he has forced to share his labour; and others he uses for his food, his clothing, or his pleasure.

The only other part of the human structure which it is now necessary to notice is the brain, whose size in proportion to the rest of the nervous system far surpasses that of any other animal. This may be at once seen by observing the proportion which the cranium, or rather the cavity containing the brain, and the face, bear to each other. In many cases also it may be estimated by what is called the facial angle of Camper, which is found by drawing a line from the most prominent part of the forehead to that of the upper jaw-bone, and observing the angle which it forms with another line drawn through the meatus auditorius externus to the base of the nose, or (the head being held in a vertical position) with a horizontal line. In man the facial angle is in the average of Europeans 80°; in some children it is a right angle, but in some negroes is not more than 70°. In the adult chimpanzee (which approaches in this respect nearest to man) the facial angle is only 35°, and in the orang or satyr 30°. (Owen,[*] in *Zool. Trans.*) In other animals it is still less, except when it is increased by the prominence of large frontal sinuses, or by the comparative shortness of the jaws. In regard to its structure the human brain exceeds all others in the development of its cerebral hemispheres, in the number and development of parts, in the depth and number of its convolutions, and in the quantity of its medullary matter in proportion to the cortical.

In the economy of the human body there are peculiarities not less marked than those in its structure. Perhaps the most characteristic is the ability which man enjoys of living on almost any part of the globe, and of thriving alike in either extreme of natural temperature. Thus the Greenlanders and Esquimaux have reached between 70° and 80° of north latitude, while the negro of Africa and the red man of America live under the equator. But even Europeans, accustomed to a temperate climate, can bear either of these extremes of cold and heat, as has been sufficiently proved by the numerous instances in which those who have gone on the Arctic expeditions have been obliged to winter in high northern latitudes; and on the other hand by the slight degree in which European settlers in the hottest parts of Africa are influenced by the temperature.

Man subsists with equal facility under various degrees of atmospheric pressure. The valleys, and the elevated tablelands of South America, some of which are 10,000 feet high, are both inhabited by man, the barometer standing in the one at 30, and in the other at only 20 inches. Condamine and Bouguer, with their attendants, lived for three weeks at a height of 14,600 French feet above the level of the sea, where the barometer stood at 15¾ inches, and the atmospheric pressure was therefore only a little more than half that to which they had been accustomed.

In adaptation with his ability to inhabit almost every climate, man can subsist on the most varied food. In the northern regions, where the earth is covered through the greater part of the year with snow, and vegetables of any kind can be procured only in the smallest quantity, the Esquimaux and Samoiedes subsist as well on animal food alone as the European does on the most carefully mixed diet;[†] and on the other hand the inhabitant of the torrid zone is not more inconvenienced by his daily subsistence on the cocoa-nut, banana, yam, rice, and other farinaceous and acid vegetables. In the temperate climates, where animal and vegetable food can be procured with equal facility, man is truly omnivorous; towards the poles animal food or fish becomes more exclusively his diet; and towards the equator his food is chiefly composed of vegetables: and there is no doubt that in each case that food which is most universally adopted is that which is best adapted for the health of the inhabitants.

Thus then, in his comparatively complete independence of the variations of external circumstances, man stands alone. It is singular that the animals who approach most nearly to him in structure should be amongst those who, in this respect of geographical distribution, differ most widely from him. The chimpanzee and orang-outan, for example, are confined to the islands of Borneo and Sumatra, the coasts of Guinea, and a few other parts of Africa; and even in their native countries they occur in but small numbers. The difficulty too of removing them to colder climates, and of preserving their lives there, even with all the advantages which human art can suggest, is immense, and after a few months they become diseased and die. Hence we may conclude that although he receives much aid in supporting the extremes of climate from the various means of defence with which his arts have supplied him, there is yet a strength and pliancy of frame in man which peculiarly fit him, and him alone, for universal distribution over the surface of the earth.

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[*] Mr. Owen has shown that the measurements which appeared to prove a greater proportionate development of the brain in these animals were made on the skulls of young individuals.

[†] The white men who trap the beaver and hunt the buffalo, in the regions of the Upper Missouri and the Columbia river, often live for many months on the flesh of animals only.

Man is further remarkable for his slow growth, and for the length of time during which he remains in a state of helpless infancy and of youth. The process of ossification and the closure of the sutures of the skull are completed later in him than in any other animal; he is unable to seek his own food for at least the three first years of his life, and does not attain to the adult period or to his full stature till he is from fifteen to twenty years old. The length of time to which his life may be prolonged is however proportionally greater than that of any animal, and is especially interesting when compared with that of those who in many respects resemble him. The greatest longevity to which the orangs attain is about thirty years, while in all nations of men instances occur of life being prolonged to upwards of 100 years.

However widely man may be distinguished from other animals in the peculiarities of his structure and economy already detailed, yet we must agree with Dr. Prichard (*Researches, &c.*, i. 175) that 'The sentiments, feelings, sympathies, internal consciousness, and mind, and the habitudes of life and action thence resulting, are the real and essential characteristics of humanity.' The difference in these respects between man and all other animals is indeed so great, that a comparison is scarcely possible. The highest moral endowments of animals are shown in their attachment to their offspring; but this ceases when the period of helplessness is past, and there is no evidence of attachment between individuals, except in the associated labours of some species, and the consentaneous actions of the male and female for the safety of the offspring. The arts of which animals are capable are limited and peculiar to each species; and there seems to be no evidence of a power of invention, or of construction for any purpose beyond that to which the original and instinctive powers are adapted. Among the monkeys the adults exercise authority over the young, and, it is said, maintain it even by chastisement; but there is no instance in which the stronger species has exercised authority over the weaker, or brought it into a state of servitude. Even when made the associates of man, and instructed by him, how little have animals learned: a few unmeaning tricks unwillingly performed, a few words uttered and constantly repeated, without choice or a conception of their meaning, and sullen passive submission, are in general the best results that can be found. There is not a proof in the whole history of animals that any species or individual has ever made an advance towards an improvement, or an alteration in its condition; whether solitary or living in herds, the habits of all remain the same; all of the same species appear endowed with the same faculties and dispositions, and each is in mental power the same throughout his life.

Contrast with these the progress of man. In his origin weak, naked, and defenceless, he has not only obtained dominion over all the animate creation, but the very elements are made to serve his purpose. Of the earth he has built his houses, and constructed weapons and the implements of art; he uses the wind to carry him in ships, and to prepare his food; and when the wind will not suit him, he employs fire and water to replace or to resist it. By artificial light he has prevented the inconveniences of darkness; he has stopped and made rivers, and has forced deserts, marshes, and forests alike to bear his food; he has marked out and measured the course of the celestial bodies, till he has discovered from them the size and form of the earth that he himself inhabits.

In intimate connection with his exalted mental endowments is man's peculiar possession of language. Other animals are naturally speechless, not from any material difference in the form of their organs (for man can teach some of them to imitate him), but from their inability to form those associations of ideas which are essential to the construction and utterance of words.

The peculiarities above described will probably be deemed sufficient to justify the separation of man as a distinct species from all others in the animal kingdom. In these respects indeed the difference between the lowest man and any animal is far greater than the change which any species can be proved or supposed to have undergone in any period of time, and under however varied circumstances; so that if degrees of difference of this kind could be measured, there would probably be as much justice as convenience in the classifications of those naturalists who have separated man from other animals to the greatest possible distance by constituting of the single species a separate genus and order.

We come now to the consideration of the variations to which the general characteristics of the human race are subject.

Varieties in form are of course chiefly referrible to differences in the structure and proportion of the parts of the skeleton, and we find the most marked characters of the different races in the varied forms of the skull. Dr. Prichard (*Researches*, i., 281) refers the varieties in the form of the skull to three principal divisions:—1st. The symmetrical or oval form, in which are included all those of the Indo-Atlantic, or Iranian nations, comprising the countries from the Himalaya mountains to the Indian Ocean, including the whole of Hindustan and the Deccan, as well as Persia and Arabia; and from the Ganges to the borders of the Atlantic, including the north of Africa and nearly the whole of Europe. In this variety the head is rounder than in the others, the forehead is more expanded, and the upper jaw-bones and zygomatic arches are so formed as to give the face an oval shape, while it is nearly on a plane with the forehead and cheek-bones, and does not project towards the lower part. The cheek-bones neither project outwards and laterally, nor forwards. The alveolar process of the upper jaw is well rounded and slightly curved vertically, so that the teeth are almost exactly perpendicular. 2nd. The narrow and elongated, or prognathous skull, which is found in the Negroes, the Papuas, Alfourous, New Zealanders, Australians, and other neighbouring oceanic nations, and of which the most marked specimens occur in the negroes of the Gold Coast. The chief character of these skulls is that they give the idea of lateral compression and elongation. The cheek-bones project forward and not outward. The upper jaw is lengthened and projects forwards, giving to the alveolar ridge and the teeth a similar projection, and thus diminishing the facial angle. 3rd. The broad and square-faced, or pyramidal skull, which is that of the Turanian, or northern Asiatic nations, Samoiedes, Yukagers, Koriacs, Tschuktschi, Kamtchadales, Tungusians, Chinese, Indo-Chinese, Tangutians and Japanese, part of the Tartar race, and of the Finnish nations of Europe, the Esquimaux, the aboriginal Americans, and the Hottentots. The Mongols afford a good specimen of this form, and the Esquimaux an exaggerated one. Its most striking character is the lateral or outward projection of the zygomata, so that lines drawn from each, touching the sides of the frontal bone, will meet only a little above the apex of the forehead. The cheek-bones project from under the middle of the orbit, and turn backwards in a large arch or segment of a circle. The orbits are large and deep; the upper part of the face remarkably plane and flat; and the nasal-bones, as well as the space between the eyebrows, nearly on the same plane with the cheek-bones.

The varieties of features dependent on the differences in the form of the frame-work just described will be at once evident. The first variety is distinguished by an evenness and regularity of features, an absence of any excessive prominence of one part in proportion to the other, a smooth and gently-rounded cheek, compressed and small lips, a full and prominent chin, and the whole face of a tolerably regular oval form. It is probable that among European nations the Greeks have displayed the greatest perfection in the form of the head, at least according to the European standard of perfection. Blumenbach has described a Greek skull in his collection, which, in the beauty of its form, agrees perfectly with the finest works of Grecian sculpture, and renders it probable that the latter were actual copies of nature, and not, as some have supposed, ideal compositions, intended to give the expression of exalted intellect or of dignity. The same author describes also the skull of a Georgian woman, equally remarkable for its elegance and symmetry, and says that its form agrees exactly with that of the head of a marble statue of a nymph in the Townley Collection.

The features corresponding with the narrow elongated skull are distinguished by the prominence of the jaws, from which they acquire a peculiarly ferocious and animal character. The compressed, narrow, and retreating forehead; the scarcely prominent nose, with its wide expanded nostrils; the thick protruding lips, and the retreating chin; the projecting cheeks, and the heavy jaws, combine to add to the characteristics which approximate, though they do not identify, the form of the negro with that of animals.

The features of the third variety differ scarcely less from the European than those of the negro, but in a different direction. Instead of the long and prominent face, we here find a face which is broadest transversely from one cheek-bone to the other; and which, as it gradually narrows, both above and below, acquires somewhat of a lozenge-shape. The nose is flat, the space between the eyes generally depressed, and the eyes themselves most frequently placed obliquely, with their internal angles descending towards the nose, rounded and open; the lips large, but not so prominent as those of the negro; the chin short, but not retreating under the lips.

But these varieties are not separated by very definite limits. There are numerous instances of negroes remarkable for the beauty and European character of their features; and daily observation shows Europeans who, in the narrowness of the skull, the lowness of the forehead, and the prominence of the jaws, closely approximate to the negro; while others in their features resemble the broad and flat-faced Tartars or Chinese. Within each of those varieties moreover are included numerous smaller divisions, which are certainly, though less prominently, distinct in their features. The varieties of national appearance between the Scotch, English, French, and Germans, for example, are in general distinguishable, though it would be difficult to define their differences. Similar subdivisions of character exist among all the varieties, and so fill up the intervals between the extreme specimens of each as to form a regular and nearly perfect series, of which the Esquimaux and negro might occupy the extremities, and the European the middle place, between the broad and high features of the one, and the narrow, elongated, and depressed skull and face of the other.

Differences in the shape of the pelvis (on which depend some important differences in the external form of the body) have been often supposed characteristic of different races of men. But from an extended series of observations by Professor Weber, it has been lately shown that every form of the pelvis which deviates from the ordinary type, in whatever race it may most frequently occur, finds its analogues in other races. He has arranged the various shapes of the human pelvis in four classes, the oval, the round, the square, and the cuneiform or oblong; and he shows that although the first is the most general form in Europeans, the second in the Americans, the third in the Mongolians, and the last in the Africans, yet that specimens of each kind may be found in all the different races.

The chest of the negro is somewhat more expanded than that of the European, the sternum more arched, the ribs larger and more roundly curved. In general also the negro's fore-arm, measured in proportion to his upper arm and to the height of the body, is longer than in the European. The knees of negroes often appear to Europeans misshapen, the bones of the leg bending out from beneath them, and the feet turned outwards in the manner commonly called splay-footed. The tibia and fibula also are rather more convex than in Europeans; the feet are flat, and the os calcis, instead of being arched, is nearly in a straight line with the rest of the tarsus; and the gastrocnemii muscles have the greater part of their mass high up in the legs, so that the calves seem to encroach upon the hams. The hands are generally narrow; the fingers long and very flexible.

It is from these modifications which the negro presents, and taking extreme cases of each peculiarity, that there has appeared some ground for supposing the negro to form a grade intermediate between the European and the monkey. But there is no character in which the difference between the lowest negro and the highest ape is not many times greater than that between the same negro and the highest European; and in all the important points of structure which we have already mentioned the differences which the negro presents are but slight. The length of the base of the skull, the somewhat more backward situation of the foramen magnum, the decrease of the facial angle, and the projection of the teeth, depend almost entirely on the prominence of the alveolar process of the upper jaw; and if a slight allowance be made for it, the negro in these points resembles the European. So also, in the prominence of his two ossa nasi, the position of the cranium over the greater part of the face, the equal length and approximation of all his teeth, the full development of the mastoid and styloid processes, which are nearly or quite wanting in all apes, and numerous other essential characteristics, there is no difference between the two races. At the same time therefore that it is allowed that the characters of form which the lowest class of negroes presents are more like those of the monkey than those of the European are, it is certain that the approximation is but slight, and that a vast space is still left between them. It is true that there coincides with this degradation of form a very low degree of intellectual development, but it is not lower than that of the Esquimaux and Hottentots and many of the third variety, who in some respects, as the breadth of the skull and face, are even more distantly removed from the monkeys than Europeans are.

Considerable differences occur in the general stature of the several races of mankind. In the temperate climates of Europe the general height varies from 4½ to 6 feet; the instances in which individuals have fallen far short or have much exceeded this standard are too exceptional to be taken into a general account. [Dwarf; Giant.] Among the native inhabitants of America great varieties occur. The Peruvians, the natives of Tierra del Fuego and of Nootka Sound, the Esquimaux, and the Chaymas are all described as very diminutive; while the Payaguas, Caribees, Cherokees, and the natives of the regions immediately north of Canada are said to be generally much above the standard of Europeans. The height of the Patagonians also, though often exaggerated, is yet remarkable; the most authentic accounts agree that they commonly attain the height of six feet, and that they not unfrequently surpass it. The standard of height among the Africans appears about the same as that of Europeans. The Hottentots are below the general size, and the Bushmen still more so, for among them 4½ feet is said to be the average height of the men, and 4 feet that of the women. The Caffres on the contrary, the neighbouring tribe to the Hottentots, are distinguished for their height and strength. The people of the north of Asia and the Laplanders and Samoiedes in Europe are generally shorter than the inhabitants of the warmer climates, but the Chinese and Japanese, who in other respects much resemble them, are of about the same stature as the rest of the Europeans.

With these varieties in stature it is interesting to compare the amounts of physical power possessed by different nations. The result of all observation has been the exact contrary of popular belief, which ascribes a decrease of physical strength proportionate to the increase of intellectual power acquired by civilization. The Spaniards in their first intercourse with America found the natives in general much weaker than themselves; and the inability of the natives to sustain the severe labour of the mines led to the introduction of African slaves, one of whom was equal to three or four Indians. Hearne and others have found the same feebleness in the natives of various parts of the North American continent, and Pallas in the Buriats. But the most exact observations were made by Peron with the dynamometer upon 12 natives of Van Dieman's Land, 17 of New Holland, 56 of the Island of Timor, 17 Frenchmen belonging to the expedition, and 14 Englishmen in the colony of New South Wales. The mean results were as follows:—

	Strength of the Arms. Kilogrammes.	Strength of the Loins. Kilogrammes.
Van Dieman's Land . .	50·6	
New Holland	50·8 . .	10·2
Timor	58·7 . .	11·6
France	69·2 . .	15·2
England	71·4 . .	16·3

The substance on which the varieties of colour in the human race depend, is seated chiefly in the soft and most internal layers of the cuticle; the true skin (cutis, derma), is similar in all nations, and the outer hardened layers of the cuticle have only a light tinge of the colour of those beneath them, which constitute what is often called the rete mucosum. [Cuticle; Skin.] The human complexion depends in part on the condition of the cutis and its vessels, and in part on that of the cuticle. In white nations, according to the fulness or comparative emptiness of the blood·

vessels of the skin, we find all the gradations of complexion, from the deep ruddiness of full health, to the blanched pallor of sickness; and in negroes, the same changes are indicated by a greater intensity of the blackness and by a dull leaden hue. These differences however chiefly characterise individuals; the national variations depend rather on the cuticle. A thick and opaque though colourless cuticle, obscuring the blood of the cutis, assists greatly in giving that deadness of hue and phlegmatic aspect which distinguishes some Europeans from others who with a thinner and more translucent epidermis are marked by a florid ruddy complexion. As the cuticle becomes darker in colour, it obscures more completely the colour of the blood in the subjacent tissue, and hence it is only in nations of light complexion that sudden blushing or paleness is at once perceptible.

With the varieties in the colour of the skin there generally coincide analogous differences in the hair and eyes. It is probable indeed that the colouring matter is the same in all; being combined in the cuticle with its peculiar cells and scales, in the hair with a horny substance, and in the choroid membrane and uvea with their minute roundish particles.

Dr. Prichard refers all the differences of complexion in man to three principal varieties:—1. The Melanocomous, or black-haired, which is the complexion generally prevalent, except in the northern parts of Europe and Asia. The coincident colour of the skin varies from a deep black, as in some Africans, to a much lighter or more dilute shade. In the copper-coloured nations of America and Africa the dusky hue is combined with red, while in the olive-coloured races of Asia it is mixed with a tinge of yellow. In intensity of colour there is every shade from the black of the Senegal negro to the light olive of the northern Hindus, and from the latter there may be traced every variety of shade among the Persians and other Asiatics, to the complexion of the swarthy Spaniards, and of black-haired Europeans in general. 2. The Leucous, or Albino variety, examples of which occur in all countries [ALBINO], but perhaps most frequently in hot climates. They are distinguished by the total absence of the colouring matter of the cuticle, hair, and eyes; hence their skin is of a milk-white or pinkish-hue, the hair silky-white or at most yellowish, the iris rosy and the pupil intensely red. 3. The Xanthous, or yellow-haired variety, which includes all those individuals who have light-brown, auburn, yellow, or red hair. Their general complexion is fair, acquiring on exposure to heat and light not a brown hue, but more or less of a red tint. The eyes are light coloured. This is the variety most prevalent in the temperately cold regions of Europe and Asia, whose climate seems peculiarly favourable to the constitution of body connected with it. This variety may spring up in any black-haired tribe; as it has in the Jews, who, though generally black haired, present many examples of the light fair complexion and reddish hair. Dr. Prichard also adduces (*Researches*, &c., i. 228) ample evidence that instances of this variety occur not only among the Greeks, Romans, Russians, Laplanders, Tartars, and other Melanocomous races of the least swarthy shade, but among the Egyptians, African negroes, and the islanders of the Pacific. The majority of these last cases have been confounded, under the term of white negroes, with the real Albinos; but they differ from them in the more ruddy hue of the skin, the colour of the iris, the blackness of the pupil, and the flaxen or red colour of the hair.

Other varieties besides those of colour occur in the skin and its appendages. The skin of many tribes of negroes is peculiarly sleek and oily, from the abundance of sebaceous and perspiratory secretion. From many also there is emitted a peculiarly strong odour, and Humboldt says that the Peruvians can by the sense of smell alone distinguish the European, the American Indian, and the negro. The cuticle of the dark tribes is thicker and coarser than that of white nations, and, from the greater difficulty of separating the latter into two layers, it has been imagined that there is no rete mucosum, or soft cuticle, in Europeans. The hair also varies almost as much in its texture as in its colour. Its chief varieties are observed in the copious, long, soft, and more or less curly hair of various colours in the European; the strong, straight, and scanty hair of the South Sea islanders; and the black, fine, wiry, crisp hair of the negro. A very general characteristic of the darker-coloured nations is either an entire want of beard, or a very scanty one developed later in life than in the white races. Mr. Lawrence (*Lectures*, 272) has adduced proofs of this in the Mongols, the Chinese, Japanese, Malays, South Sea Islanders, negroes, and the Indians of North and South America; but the fact has been somewhat obscured by the practice, which is generally prevalent among these nations, of extirpating the little hair which they have.

In the performance of the several functions of the economy, it has not yet appeared that any fixed difference exists in the several races of men, except in cases in which the variation is due to the difference of climate, and occurs alike in all races when subjected to the same influences. In physical endowments also, however great may be the distance between the degrees of intellectual and moral elevation possessed by civilised and uncivilised nations, yet there is sufficient evidence to prove that in all there may be traced the same mental endowments, similar natural prejudices and impressions, the same consciousness, sentiments, sympathies, propensities, in short a common physical nature, or a common mind. (See Prichard's *Researches*.)

This accordance in the physiological and psychical properties of all nations affords one of the strongest possible arguments in favour of the whole human race being but one species; for, as Dr. Prichard observes, 'the physiological characters of race are liable to few and unimportant variations;' and therefore when we find that in a number of individuals spread over the greater part of the globe no other differences occur, either in the average length of life, or the extreme length occasionally attained, in the periods of gestation, of infancy, of puberty, and of other changes in the economy, or in the habits, instincts, affections, and intellectual faculties, than may be fairly attributed to the differences of external circumstances, it may be at once concluded that they are all members of the same family, and the offspring of one common stock. This argument receives support from the fact that in many animals, of which from their forms alone it might be difficult to determine whether they belonged to the same or different species, a diversity occurs in their physiological characters. Thus the wolf and dog, though in many other respects closely resembling each other, differ in the period of gestation, the she-wolf carrying her young ninety days, and the bitch (of whatever variety) only sixty-two or sixty-three. In like manner the dog is strongly distinguished from the wolf in his inclination, which is everywhere observable, to associate with man; and the fox, from both the wolf and dog, in his solitary habits. Yet in form these three agree so nearly, that some naturalists have deemed them to be the same species. Similar differences may be observed in the ox kind, between the domesticated ox and the bison and buffalo, which, though nearly related to him in form, are totally opposite in disposition and habits. So also the most marked differences between the sheep (in all its varieties) and the goat are to be found in their instincts and consequent modes of life; and so on through numberless other instances, all tending to prove the permanence of physiological and psychical characters in each species, and their comparative independence of those influences by which modifications in form and colour are produced.

It is necessary however to show that the structural differences which seem to distinguish so clearly the several nations of mankind coincide with similar variations in other animals which are descended from a common stock. Such variations occur especially in animals which have been domesticated, and thus subjected to influences in many respects analogous to those under which man has fallen in the progress or decline of civilization. No one, for example, will be inclined to deny that the varieties of dogs (which there is reason to believe are all of one species) present far greater differences in form and colour, and in some parts of their habits and instincts, than any that are observed in man. And it is worthy of observation that in the most highly domesticated races, as the spaniel, the cranium is more fully developed, and recedes further from the form of the skull proper to the wolf, than in those which are less cultivated, as the mastiff. In this we can trace a series of varieties very analogous to those of the monkey, the negro, and the highly civilised European.

The races of swine present even more remarkable instances of variation, which have been particularly described by Blumenbach (*Beyträge zur Naturgesch.*). It is certain that these all descend from the wild boar; and it is equally certain that swine were unknown in America till carried there by the Spaniards. Yet in that country they have already degenerated into breeds very different from each other and from their original. Those taken to Cubagua became a race with toes half a span long, and those of Cuba became more than twice as large as their progenitors. In Normandy the swine are remarkable for the length of the bone of the hind leg. Swine with solid hoofs were known to the antients, and large breeds of them are found in Hungary and Sweden. In some also the hoof is divided into five clefts. In Guinea they have long ears couched upon the back; in China, a large pendant belly and very short legs; at Cape Verd and other places, very large curved tusks. Thus then in one species we find changes even greater than those which occur among men; and as to the most important, Blumenbach says that the whole difference between the cranium of the negro and that of a European is by no means greater than that which exists between the cranium of the wild boar and that of the domestic swine. An examination of the different breeds of sheep, horses, oxen, goats, cats, rabbits, and still more of domestic fowl, would in like manner show that all these species, even while under observation, are subject to greater variations than are found in the different races of men.

In respect of colour, a perfect analogy holds between the varieties of domestic animals and those of men. In all those enumerated above, examples occur of the melanocomous, leucous, and xanthous varieties springing up casually or existing constantly in particular breeds. Thus even in England the cattle of different counties may be recognised by their colour as well as their forms. Azara remarks of the horses and oxen of Paraguay (where both species have run wild and multiplied very rapidly) that while all those that are domesticated vary considerably in colour, those that are wild have all the same colour; the horses a chesnut or bay-brown, the oxen reddish-brown on the back and black on the rest of the body.

The analogy between the variations to which domesticated (and more rarely wild) animals are subject, and those which are observed in men, is a strong argument for the unity of the human species. Another which deserves much weight is drawn from the propagation of the several races. It is well known that among all other animals the hybrid productions of parents of different species are either quite barren or so little prolific that they soon become extinct, and that an intermediate race cannot be maintained even to the second generation without a return to the pure blood of one or other parent. On the other hand it is observed among domestic animals that the progeny of different varieties of the same species exceed in vigour, and are even more prolific than their parents; so that intermediate races are apt very soon to become more numerous than the originals from which they sprung. Exactly the same principle holds in the human race. All nations propagate together with equal facility, and Dr. Prichard has shown that the progeny of parents of different nations have in many instances exceeded those from whom they sprung in vigour and in the tendency to multiplication.

Lastly, a consideration of the diseases to which mankind are subject shows that the greater part of them are common to all, though modified in different climates, and though a few produced by local circumstances are peculiar to individual tribes.

From these facts therefore, by which it is shown that in all those characters in which external circumstances have least influence the whole human race agree, while in others more easily modified they present only those changes which are observed to an equal or even a greater extent in animals known to have descended from a common stock, it may fairly be concluded that mankind is composed of but one species. The characters of this species given by Blumenbach, and generally received, are: 'Erect, two-handed, unarmed, rational, endowed with speech; a prominent chin; four incisor teeth above and below; all the teeth equally approximated; the canine teeth of the same length as the others; the lower incisors erect.' The same author divides the species into five varieties, whose characters are as follows (Lawrence, *Lectures*, p. 477):—1. Caucasian variety: a white skin, either with a fair rosy tint, or inclining to brown; red cheeks; hair black, or of the various lighter colours, copious, soft, and generally curved or waving. Irides dark in those with brown skin; light in the fair or rosy complexioned. Large cranium with small face; the upper and anterior regions of the former particularly developed, and the latter falling perpendicularly under them. Face oval and straight, with distinct features; expanded forehead, narrow and rather aquiline nose, and small mouth; front teeth of both jaws perpendicular; lips, particularly the lower, gently turned out; chin full and rounded. Moral feelings and intellectual powers most energetic, and susceptible of the highest development and culture. This variety includes all the antient and modern Europeans except the Finns; the former and present inhabitants of Western Asia, as far as the River Oby, the Caspian Sea, and the Ganges (that is, the Assyrians, Medes, and Chaldæans; the Sarmatians, Scythians, and Parthians; the Philistines, Phœnicians, Jews, and the inhabitants of Syria generally; the Tartars, properly so called; the tribes actually occupying the chain of Caucasus; the Georgians, Circassians, Mingrelians, Armenians; the Turks, Persians, Arabians, Afghauns, and Hindus of high castes); and the northern Africans, the Egyptians, Abyssinians, and Guanches.

2. The Mongolian variety:—characterised by olive colour, which in many cases is very light, and black eyes; black, straight, strong, and thin hair; little or no beard; head of a square form, with small and low forehead; broad and flattened face, with the features running together; the glabella flat and very broad; nose small and flat; rounded cheeks, projecting externally; narrow and linear aperture of the eye-lids; eyes placed very obliquely; slight projection of the chin; large ears; thick lips; stature, particularly in the countries near the north pole, inferior to that of Europeans. It includes the tribes of Central and Northern Asia, as the Mongols, Calmucks, and Buriats; the Mantchoos, Da-urians, Tungooses, and Coreans; the Samoiedes, Yukagers, Koriacs, Tschuktschi, and Kamtchadales; the Chinese and Japanese, the inhabitants of Tibet and Bootan, of Tonquin, Cochin-China, Ava, Pegu, Cambodia, Laos, and Siam; the Finnish races of Northern Europe, as the Laplanders and the tribes of Esquimaux.

3. The Ethiopian variety:—skin and eyes black; hair black and woolly; skull compressed laterally and elongated towards the front; forehead low, narrow, and slanting; cheek-bones prominent; jaws narrow and projecting; upper front teeth oblique; chin receding. The eyes prominent; the nose broad, thick, flat, and confused with the extended jaw; the lips, and particularly the upper one, thick. All the natives of Africa, not included in the first variety, belong to this.

4. The American variety:—skin dark, and more or less of a red tint; black, straight, and strong hair; small beard; and a countenance and skull very similar to the Mongolian. The forehead low, the eyes deep, the face broad, particularly across the cheeks, but not so flattened as in the Mongols. Mouth large; and lips rather thick. This variety includes all the native Americans except the Esquimaux.

5. The Malay variety:—brown colour, from a light tawny to a deep brown. Hair black, more or less curled, and abundant; head rather narrow; bones of the face large and prominent: nose full, and broad towards the apex; mouth large. In this are included the inhabitants of Malacca, of Sumatra, Java, Borneo, Celebes, and the adjacent Asiatic Islands; of the Molucca, Ladrone, Philippine, Marian, and Caroline groups; of New Holland, Van Dieman's Land, New Guinea, New Zealand, and of all the islands of the South Sea.

Cuvier distinguishes only three principal divisions—the Caucasian, the Mongolian, and the Ethiopian; remaining doubtful as to the Malay and American varieties. Dr Prichard on the other hand (and his authority should have the greatest weight in everything relating to the subject) divides the species into seven principal varieties:—1, The Iranians, who in the form of their skulls and other physical characters resemble Europeans, in which are included, as before detailed, all the Caucasian variety. 2, The Turanian, who are nearly the same with the Mongolians of other writers. 3, The native Americans, except the Esquimaux and some others resembling them. 4, The Hottentots and Bushmen. 5, The Negroes. 6, The Papuas, or woolly-haired nations of Polynesia. 7, The Alfourou and Australian races.

MAN, ISLE OF, is situated between 54° 4′ and 54° 27′ N. lat., and 4° 17′ and 4° 43′ W. long.; 34 miles from St. Bees' Head in Cumberland; 16 from Burrow Head in Scotland; and 28 from Strongford, in Ireland. Its length, from north-north-east to south-south-west, is about 30 miles; its breadth varies from about 8 to 11 miles, but is much narrower at its extremities; and its circumference is about 75 miles. Its surface is about 220 square miles. The Calf of Man is a small island situated to the south-west of the island, nearly a mile from it, and from 3 to 5 miles in circumference. The Kitterlins, another small rocky island, is situated between the Isle and Calf of Man. The Isle of Man is the Mona of Cæsar, the Monapia of Pliny, Monæda of Ptolemy, Menavia of Orosius and Bede, and Eubonia of Nennius. Its derivation is probably from the British word 'mon,' which means isolated.

The island is intersected by a ridge of mountains, which runs from north-east to south-west nearly through its whole length, and chiefly occupies the central parts. Dr. Berger, who has fixed the heights of 89 of these hills, considers them to compose three chains, separated from each other by high table-lands, and crossed by three very narrow openings. Snafield, the highest point of them all, is 2004 feet above the level of the sea, and North Barrule rises to 1804 feet. The mountains, commons, and waste lands are supposed to cover 50,000 acres, leaving above 90,000 acres for cultivation. England, Scotland, Ireland, and Wales are visible from the summits of the mountains on a clear day. The Neb, Sulby, and other streams which flow from the mountains enter the sea at Peel, Laxey, Douglas, and Ramsey. The coast is in many places very precipitous.

Rocks of mica-slate and clay slate compose all the mountains. These slates form also the coast at Spanish Head, where some precipices exceed 300 feet in height. The summit of one of the cliffs contains a druidical monument. Mica-slate is found at Snafield, the rounded summit of which is covered with grass. The base of this mountain is rich in metals. The galena which is found here contains from 90 to 130 ounces of silver per ton. Copper pyrites has 5 ounces of silver per ton, and black-jack sells for 5*l.* per ton. Clay-slate forms the largest portion of the island and nearly all the Calf. In one of the varieties of this slate, found towards its junction with the grauwacke rocks, the surfaces of the seams shine with metallic lustre. A stratified grey stone, which is used in building, is the second variety of clay-slate. The third variety, at Spanish Head, is used for lintels, &c. The roofing-slate, drawing-slate, and one of a vermillion colour near Braddah, make up the other varieties of clay-slate found in the island. The secondary slate formation, resting on the primary, consists of grauwacke, grauwacke slate, and old red-sandstone, and forms the greater part of the rocky sea-coast of the island, but does not extend much inland. The cliffs of this formation on the coast at Spanish Head seldom exceed 200 feet, and present a bold and picturesque appearance. There is a belt along the west coast, about two miles in width, consisting of old red-sandstone, of which Peel Castle is built. Limestone extends several miles on each side of Castletown. The steps at the main entrance of St. Paul's, London, presented to the dean and chapter by Bishop Wilson, consist of the first variety of this rock. Castle Rushen was built of the second variety, which is of a bluish-grey colour. The third variety, of a light grey colour, consists chiefly of shells. The fourth variety is magnesian, rarely contains organic remains, and its colour is yellow or white grey. Near Poolvash veins of trap, from two to six feet broad, break through the dark grey limestone. Boulders occur, of which the most numerous are granite, which differs from that of the island. Boulders of sienite, porphyry, and quartz are scattered from north to south, and the blocks of clay-slate and mica-slate mixed with the quartz prove it to belong to the island. The other boulders not formed of quartz appear to have come from the north and north-west, and enormous masses of them are found high up on the sides of one of the most elevated mountains. Boulders of sienite form a druidical circle near Bishop's Court. Granite in situ, containing mica, felspar, and quartz, is found in blocks on the north side of South Barrule. The decomposition of the felspar forms a fine powder, which is sold for polishing iron.

The soil in the south part of the island is a light clay formed by the decomposition of the clay-slate. The mountainous district is adapted only for pasture, and judicious culture alone can render the hilly parts productive. The soil however in the level country, extending from Kirkmichael to the north-eastern extremity of the island, consists of sand, clay, and peat, and contains excellent marl. The soil in the neighbourhood of Castletown is well adapted for wheat, and the abundance of lime supplies the farmer with a cheap manure. The climate, although variable, damp, and windy, is temperate. The highest and lowest temperatures observed are about 77° and 26° Fahr. respectively: the mean annual temperature is about 49°. The annual fall of rain is about 37 inches.

The harvests are frequently late, owing to the climate. The agriculture of the country, in consequence of the attention paid to the herring-fishery, was left very much to the women, who were accustomed to perform all the hard work of a farm, and frequently without their aid the corn itself would have been unthrashed. The smallness of the farms, and the nature of the leases, very much impeded improvement. The breeds of cattle, although Bishop Wilson was not inattentive to their improvement, long continued very indifferent. When however Mr. Curwen formed an Agricultural Society at Workington, he did not neglect the interests of the island, but both by precept and example did everything in his power to improve its husbandry. Some excellent farmers from England and Scotland, who settled on the island, set the example of good farming. The annual value of the land among the hills varies from 5*s.* to 10*s.* per acre, and in some of the best cultivated districts amounts to 40*s.*, and near the towns is still higher. Many of the hedges present a very unsightly appearance, though more attention is paid to them than formerly. Wheat, and in some years potatoes, have been exported in very considerable quantities. The turnip husbandry has been much improved lately, and is steadily advancing. The largest part of the island is in the hands of yeomen, who farm their own estates, which are from 10 to 200 acres. Few properties are worth more than 1500*l.* a-year. There are about 8000 acres in wheat, which, at 2½ quarters per acre, produce 20,000 quarters; of barley 5000 acres, which, at 4 quarters per acre, produce 20,000 quarters; and 13,000 acres of oats, which at 3 quarters, produce 39,000 quarters. The Houghton sheep, peculiar to the island, are slow feeders and long in coming to maturity; their wool is much used for making stockings. A judicious system of turnip culture has recently been introduced into the Calf of Man, which will soon make this desolate spot productive. The best means for effecting durable improvements in the agriculture of the island are a judicious adaptation of stocks to the different soils. Thus the kyloes and galloways will suit inferior and mountain soils, while the short-horned may be introduced upon rich pastures. A judicious selection of such varieties of grain also as suit the soils and the climate would greatly increase the productiveness of the island.

The early history of the Isle of Man is obscure. It was governed by a succession of Norwegian kings, until Magnus, finding himself unable to preserve the Western Isles, sold them to Alexander III., king of Scotland, A.D. 1264. Soon after this Alexander reduced the Isle of Man, and appointed Regulus king, with whom he entered into a treaty, stipulating that the king of Man should furnish ten ships for Scotland, on condition that Alexander defended the isle from all foreign enemies. William de Montacute, with an English force, afterwards drove out the Scots, but his poverty prevented him from keeping it, and it thus became the property of the kings of England. In 1307 Edward II. bestowed this island first upon the earl of Cornwall, and then on Henry Beaumont. The Scots, under Robert Bruce, recovered and possessed it until 1340, when the earl of Shaftesbury wrested it from Scotland in the reign of Edward III., and sold it to the earl of Wiltshire, who was afterwards executed for high treason, and his estates confiscated. Henry IV. granted it to Henry Percy, earl of Northumberland, and in 1403, in consequence of Henry Percy being attainted of high treason, and the Isle of Man forfeited, the king of England gave it, with the patronage of the bishopric and of other ecclesiastical benefices, to William Stanley and his heirs, afterwards the earls of Derby, for his aid in putting down the rebellion of Henry Percy, on condition that he should give the kings of England two falcons on their coronation. Thomas earl of Derby relinquished the title of king of Man, and took that of lord. James I. made a new grant of the island to William, sixth earl of Derby, which the parliament confirmed. James earl of Derby, in consequence of his adherence to Charles I., was taken prisoner and executed at Bolton, in 1651. His wife defended Castle Rushen, to which she retired, until Christian, on whom she relied, and who had the command of the forces, capitulated to Birch and Duckinfield, who had invaded the island with ten vessels. The parliament granted the island to Lord Fairfax. King Charles II., on his accession to the throne, gave it to the earl of Derby, the son of the earl who had been beheaded. James earl of Derby dying without issue, the inheritance devolved upon James, second duke of Athol, who was descended from the youngest daughter of the seventh earl of Derby. As both public justice and the revenues of the kingdom were injured by the island affording undue protection to debtors, outlaws, and smugglers, the British government passed an act in 1726, empowering the earl of Derby to sell his royalty and revenue. Various causes however prevented the sale being completed until 1764, when the duke of Athol sold his sovereign rights for 70,000*l.*, with his civil patronage, and the two castles of Peel and Rushen. The duke however still retained the title of lord of Man, enjoyed all its ecclesiastical patronage, with mines, minerals, treasure trove, and other privileges. The duke, after repeated applications to government, obtained a perpetual grant of a fourth of the net customs revenue of the island, and enjoyed the honour of governor-general. By a subsequent arrangement with the duke on the part of the English government (6 George IV., c. 34) Great Britain now enjoys all the sovereign rights and privileges of the island. The customs of the ports are also vested in the crown, and a new code of revenue laws was likewise introduced that year (chap. 115), which established the privilege of licensing such a stipulated quantity of certain goods charged with specified duties as will serve for the consumption of the inhabitants of the island.

No part of the kingdom abounds so much in Danish remains. The various tumuli, barrows, weapons, coins, and Runic characters afford clear evidence of the connection which the Northmen had with this island. Some Druidical temples have been discovered. The venerable remains of Rushen Abbey, which belonged to the Cistercian order, and of another near Douglas, for female votaries, supposed to have been founded by St. Bridget, show the influence of the church during the middle ages. The tumulus at Tinwald, which is approached by turf steps on the east, presents the appearance of a truncated cone divided into three stages, which are raised about three feet above each other, and proportionally diminished both in circuit and width until they approach the summit, where the king of Man formerly sat on solemn occasions. The local laws of the island still continue to be read and promulgated here annually before the governor, two deemsters, keys, council, and various officers of state, and divine service concludes the solemnities of the day. The Tinwald Mount (which means either 'a fence for an assembly,' or 'a juridical hill') is situated near the intersection of the high road from Castletown to Ramsey with that from Douglas to Peel.

The whole island was formerly divided into 600 portions, called quarter-lands; but this number was increased, according to the authority of Feltham, in 1798, to 750. Possession for twenty-one years gives a good title to property. The right of pasturage for a certain number of cattle on the commons, and of quarrying stones and digging peat, belong to proprietors.

The principal towns in the island are Castletown, Douglas, Peel, and Ramsey. Castletown, situated in the south-west of the island, is a neat town, with spacious and regular streets. There is an open well-built square. The houses are situated on the opposite sides of a small creek, opening into a bay in the shape of a crescent, the extremities of which project into the sea. Castle Rushen, in Castletown, was built, according to tradition, in the year 960, by Guttred, a Danish prince, who is said to have been buried here. The stone glacis by which it is surrounded is supposed to have been built by Cardinal Wolsey. The stone-work of the keep and several interior portions of the buildings are nearly entire; but, in consequence of the damages done by repeated sieges, the other parts have been repaired. The prisoners must have been lowered into the keep by ropes, as there are no steps for descending. The first stone of a neat and beautiful chapel in this town was laid by Bishop Wilson in 1698. The college, which has 200 pupils, and is conducted with great ability and success by various masters, was built by the exertions of the late Bishop Ward, aided by 1000*l.* left by Bishop Barrow. There is also a neat chapel adjoining the college. The courts of chancery and common law are held in Castletown, and it is the residence of the governor. The House of Keys meet here. The number of houses in Castletown is calculated at 500, and the population in 1831 was 2077. When the last census was taken the number of prisoners in the gaol of Castle Rushen was 12 males and 3 females.

Douglas, in the parish of Kirkbraddan, formerly written Dufglass, and supposed by some to derive its name from the two rivers Doo and Glass, is situated on the south-east coast of the island. The bay extends three miles, from Clayhead to Douglas Promontory, in the form of a crescent, and is sheltered from all winds except the south-east. The beauty of the scenery, the magnificent appearance of Castle Mona, built by the duke of Athol, and the numerous gentlemen's seats and neat cottages which surround the town, give the place a very agreeable appearance. The pier, which is 520 feet long and 40 or 50 broad, was built by the government at the cost of 25,000*l.*

The old streets are generally very irregular, but some which have been lately finished, or are now in progress, are regularly built. The street which fronts the river forms a striking contrast with the older part of the town. St. George's Chapel is pleasantly situated on an eminence at the west end of the town. There is a Lancasterian school capable of containing 700 scholars, which is well attended. The population of Douglas was 6786 in 1831; according to a more recent census it contains 800 houses, occupied by 1500 families, and a population of 7000. This town, which a century ago consisted of little more than clay-built huts, has now the chief trade of the island. There is a linen manufactory and a paper and woollen manufactory at Douglas.

Peel, formerly called Holm Peel, is on the west coast of the island. The castle, which is built on a small rocky island, encloses an irregular space of more than two acres, and is separated from the town by a narrow channel, scarcely a foot deep at low water. A strong wall, built as a security for the harbour, connects the island and castle with the mainland. There is a pyramidal mound of earth in the centre of the castle, surrounded by a ditch five feet and a half broad. The churches of St. Patrick and St. Germain are situated near this mound. The former was probably built before the Norman conquest; the latter, which was erected about 1245, is the cathedral church of the island, but is now only used for a burying-place. Peel has only one church. The Methodists are almost the only dissenters. There is an endowed school for grammar and mathematics. No attention is now paid to the harbour, and the pier is altogether destroyed. This town, which flourished through smuggling, is now, since it has ceased, in a very decayed condition. The population in 1831 was only 1729.

Ramsey is situated on a spacious bay, where there is safe anchorage, on the north-eastern coast of the island. It is built in a straggling and irregular manner. In this town the courts of law for the north part of the island are held. The Methodists are the most numerous dissenters. Its population in 1831 was 1754.

The herring-fishery employs about 250 boats, of from 15 to 30 tons burthen, and from 2000 to 3000 fishermen. The value of one of the boats, nets, &c., is above 80*l.* Successful years at present yield 40,000 or 50,000 barrels of herrings, of which one-third are used on the island. The deep fishing, if properly followed out, would add very much to the wealth of the island, and would form an active body of permanent fishermen.

Duties levied on imported goods, charges on vessels and boats trading to the island, the harbour dues, taxes on dogs, carriages, and public-houses, are the taxes of the island. The two last are expended in repairing harbours, roads, and bridges. The customs average from 20,000*l.* to 25,000*l.* After paying salaries to the officers employed by government, a surplus is annually remitted to England of from 12,000*l.* to 15,000*l.*

Two steam-vessels ply between Liverpool and the island: there is one from Dublin to Whitehaven which calls at Douglas, and there is constant communication between Scotland and the island.

The established religion is that of the Church of England, but all denominations of Christians have the free exercise of their religion. The Methodists are supposed to be nearly one-tenth of the population. The value of thirteen out of seventeen livings in the diocese is 90*l.* per annum each. The episcopal see is supposed to have been fixed at Sodor in the ninth century, but the site of this place is not now known. The bishop of Sodor and Man, whose authority is wholly confined to this island, is a suffragan of the archbishop of York. He has no seat in the House of Lords. Several distinguished men have filled the see of Sodor and Man. Barrow, Wilson, and Hildesley have been rarely surpassed by any bishops of the Christian church. Barrow endowed schools, and formed a system of parochial instruction. Bishop Wilson, who filled the see for fifty-six years, secured the people of this island, by the Act of Settlement, a deliverance from their vassalage to the lord of the island, and manfully and successfully defended the interests of his clergy against the same noble family. He translated various works into Manks, and commenced the translation of the Scripture into that tongue, which was completed under Hildesley. The whole island felt for him the affection of a father, and the greatest pleasure of the people was to receive his benediction. Although offered a bishopric in England, he preferred his own little island and narrow income to rich preferment in his native country. His code for conducting the affairs of his diocese was so perfect, that it has been observed of it, that should all others perish, it would fully supply their loss. Many men have been distinguished by greater originality and vigour of mind, but few have equalled him in Christian charity and benevolence.

The bishop of Sodor and Man has an archdeacon and his assistant, two vicars-general, and an episcopal registrar, to assist him in managing the affairs of his diocese. Ecclesiastical courts for the proving of wills, granting administration, and carrying on suits against executors and administrators, are held by the bishop or his vicars-general for one half of the year, and by the archdeacon or his official for the other. There is an appeal from these courts in all spiritual affairs to the archbishop of York. The vicars-general hold a court every Friday. The clergy are assembled every year in convocation at the bishop's court, and a consistorial court is convened on the last Thursday of every month.

All the laws of the island are contained in one small volume. There are no barristers, and the services of the attorneys, who act both as attorneys and barristers, are in many cases rendered unnecessary by the clients pleading their own causes. Law is cheap, and litigation is common. The Manx agricultural population, who are generally yeomen, are frank, open, and kind; and most of them have all the necessaries, and some of them the comforts of life.

The House of Keys, which has both a legislative and judicial character, consists of 24 of the principal commoners of the island. They must have landed property, and have attained the age of twenty-one. They are now a self-elected body, but were formerly chosen by the people, and were the organ by which they acted. The two deemsters have equal jurisdiction, and are judges in civil and criminal cases. The Court of Chancery is held eight times in the year, where the governor acts as chancellor, with the assistance of the deemsters and other chief officers. The Court of Exchequer is generally held immediately after the former, and the governor, assisted by the deemster, is sole judge. This court takes cognizance of all matters connected with the revenues. The common-law courts are held at different places for the different sheadings into which the island is divided, called Glenfaba, Michael, Ayre, Garff, Middle, and Rushen. The courts at Peel are for the sheadings of Glenfaba, Michael, and Ayre; at Douglas, for Garff sheading; at Castletown for the sheadings of Middle and Rushen. All disputes about land and all personal actions for the recovery of damages are tried in this court before a jury. The deemsters administer the oath in the Manx language, deliver the charge, and receive the verdict. There is an appeal from the judgment of a court of common-law, first to the House of Keys, afterwards to the governor, and finally to the privy-council. There is a general gaol delivery twice in the year. The high bailiffs, who act as magistrates in the five towns of the island, were established in 1777, and can hear and determine all causes under forty shillings; they also maintain the peace and apprehend offenders.

Bishop Barrow formed a school, in 1666, in every parish in the island, and Bishop Wilson says, in 1747, 'We have petty schools, which are the foundation of catechising in every parish, and, though meanly endowed, may by care become special means of improvement.' The teaching of the Manx language, which is a dialect of the Erse or Celtic, has contributed to the general improvement of the natives, all of whom will probably in a short time be able to speak and read English. The present Archdeacon Philpots has taken much pains to promote the religious knowledge and intellectual improvement of the inhabitants.

Population.—Bede states that the island contained only 300 families, or about 1600 persons, in the eighth century. Holinshed, in 1584, says, 'There were formerly 1300 families in this island, but now scarcely half that number.' In 1667 it contained 2531 men between the ages of 16 and 60. In 1726 the population was 14,027; in 1757 it amounted to 19,144; in 1784, to 24,924; and in 1791, to 27,913. According to the census of 1831, the whole number in the island was 41,000. The increase during the ten years preceding 1831 amounted only to 919 persons; and the chief places where this took place were Douglas, Kirkpatrick, and Ramsey. The manufacturers in the Isle of Man are generally weavers and a few spinners.

(Townley's *Journal in the Isle of Man*; Feltham's *Tour through the Isle of Man*; Wood's *Account of the past and present State of the Isle of Man*; *Commissioners' Report for* 1793; *Population Returns*; *Education Returns*; M'Culloch's *Statistical Account of England*; *Communications from the Island.*)

MANAAR, Island. [Ceylon.]

MANAKINS, the name of a group of small birds remarkable for the rich tints of their plumage (*Pipra* of authors). Mr. Swainson makes them a subfamily of the *Ampelidæ*, under the name of *Piprinæ*. [Pipra.]

MANATEE. [Whales.]

MANCHA, LA, a province of Spain, bounded on the north by Toledo in New Castile, on the south by Andalucia, on the east by Cuenca and Murcia, and on the west by Extremadura. Its greatest length is 160 miles, and its greatest breadth 100. It contains about 7500 square miles. Its population, according to the census of 1788, amounted to 206,160 souls, of whom 749 were priests, 729 monks, and 610 nuns: within the last fifty years however it has somewhat increased, and may at present be estimated at more than 250,000.

The country for the most part consists of immense plains, elevated 2000 feet or more above the level of the sea, barren, sunburnt, and dusty, with scarcely a tree or house to relieve their dreary monotony, and affording only a scanty pasturage to vast numbers of mules and sheep. The towns and villages are mean and ruinous, indicative of the decay of the province. Cultivation is almost confined to corn, vines, and olives. In its great deficiency in natural beauty La Mancha bears a striking contrast to the fertile and picturesque regions to the south and east. Such is the centre of the province. Its frontiers are mountainous. On the south, forming the boundary between La Mancha and Andalucia, rises the lofty chain of the Sierra Morena; on the north are the mountains of Toledo, almost wholly in the province of that name; and on the south-east of La Mancha, but within its boundaries, is the Sierra de Alcaraz.

The province is divided into Upper and Lower La Mancha. The capital is Ciudad Real, situated in a fertile plain, and formerly a flourishing city; but its trade and manufactures of wool and leather are now almost extinct, and its population has dwindled down to 8000 or 9000. Its streets are straight and regular, and it contains a spacious square, in which bull-fights are occasionally held. The other towns of importance are Almagro, Manzanares, Val de Peñas, Almaden, Quintanar de la Orden, and Toboso—immortalised by Cervantes.

The climate of La Mancha is intensely hot in summer, and rendered severely cold in winter by keen winds, though snow and ice are rare, except on the mountains. The soil is poor; it is parched by a burning sun, and scarcely refreshed by rivers; for the Giguela, Zancara, Mundo, Guadarmena, Azuer, Jabalon, Las Fresnedas, and Guadalen, are mere rivulets. The Guadiana alone, which rises in the Sierra de Alcaraz, and intersects the greater part of the province, is of considerable volume. About four leagues from its source it loses itself in a marsh, and after running under ground for five leagues, re-appears at the small lakes called 'the Eyes of the Guadiana.' This remarkable phenomenon has given rise to the saying that there is in Spain a bridge five leagues in length. The population of La Mancha is principally agricultural. Wages for field labour are three reals, or sevenpence-farthing sterling per diem. The productions are corn, especially oats—olives, which grow in the neighbourhood of Ciudad Real, Almagro, and Malagon—and wines, which are excellent, and so cheap that a gallon costs no more than fourpence sterling. The wine of Val de Peñas is the most esteemed: it is a red wine, light and racy, but, unless drunk in the province, is much injured in flavour by the skins in which it is customary to transport wines in Spain. Its price on the spot is about 3*l.* 10*s.* per pipe. La Mancha also produces some saffron and honey, but scarcely any fruit. The mules of La Mancha are famed for their great size; mules and asses are used for all the purposes of husbandry, as there are no horned cattle in this province. Beef is consequently not to be obtained, but mutton costs only about 2½*d.* and bread 1½*d.* per lb.

La Mancha is rich in mineral productions. There is a mine of silver, at present abandoned, together with several of antimony, near Almodóvar del Campo; and a mine of mercury, belonging to the crown, and very productive, at Almaden. [ALMADEN.] Ochre, rock-crystal, bole, calamine, and cinnabar are also found in La Mancha. There are likewise several springs of mineral waters, both hot and cold.

La Mancha formerly possessed some considerable manufactures, which have greatly decayed; but the spinning of wool still gives employment to several thousands of the population. Flannels, blond lace, leather gloves, hard soap, and gunpowder are also manufactured, but all on a small scale, and for the consumption of the province. Commerce is at a still lower ebb; and were it not for the productions of the soil with which La Mancha supplies the other provinces, it would be utterly dead. In exchange for these, La Mancha receives articles of luxury, and even many of the necessaries of life, especially in the way of clothing.

The Manchegos are grave, solemn, and punctilious, but courteous, peaceable, and good-humoured. The lower orders are hardy, industrious, frugal, and little addicted to pleasure. Everything indeed in La Mancha partakes of the melancholy character of the scenery; and were it not for the charm with which Cervantes has invested the province, and the similarity of manners and customs existing at the present day to those depicted in his immortal work, La Mancha would be to the traveller the most dreary and uninteresting part of Spain.

(Laborde's *Itinéraire Descriptif de l'Espagne;* Townsend's *Journey through Spain;* Inglis's *Spain in* 1830; Cruz, *Viage de España.*)

MANCHE, a department of France, deriving its name from La Manche (the Sleeve), or English Channel, on the coast of which it lies. It is bounded on the west, north, and north-east by the Channel; on the east by the department of Calvados; on the south-east by that of Orne; and on the south by those of Mayenne and Ille et Vilaine. Its form is irregular, but approximates to that of a rectangle, having its greatest length from north by west to south by east, from Cape de la Hogue to the neighbourhood of St. James, 92 miles; and it greatest breadth from Pontorson through Mortain to the border of the department of Orne, 39 miles. Its area is estimated at 2298 square miles, which is rather under the average area of the French departments, and about equal to the conjoint areas of the English counties of Kent and Surrey. The population of the department in 1831 was 591,284; in 1836 it was 594,382, showing an increase of only 3098, little more than a half per cent. in five years, and giving 258 inhabitants to a square mile. In amount and density of population the department exceeds the average of the French departments in the proportion of five to three; but is much exceeded by the English counties with which we have compared it. The chief town is St. Lô on the river Vire, in 49° 7′ N. lat. and 1° 6′ W. long.; 152 miles from Paris, in a direct line west by north, or 171 miles by the road through Mantes, Evreux, Caen, and Bayeux.

The coast-line forms two sides (the north and the west) of the rectangle to which the form of the department approximates, and part of the third side (the eastern); the northern part of the department is a peninsula, formerly known as the district of Le Cotantin, or Cotentin, from the town of Coutances. The coast-line forms on the south-western side of the department the bay of St. Michael, which is occupied by shoals, intersected by the channels of the rivers that empty themselves into the bay. From this bay the coast runs in a tolerably regular line north by west to the village of Carteret, receiving the Sienne, the Ay, and some other small streams. From the village and small sandy haven of Carteret the coast runs north to the rocky headlands of Cape Flamanville and the Nez (Ness or Nose) de Jobourg, between which is the small bay (Anse) of Vauville. Near the Nez de Jobourg is Cape la Hogue, the north-western point of the rectangle. Opposite to the western coast are the little island of Chaussey with its granite quarries, and the Channel Islands, which belong to England; Jersey is opposite the mouth of the Ay, and Aurigney or Alderney, the nearest to the French coast, is opposite Cape la Hogue, from which it is separated by the Raz de Blanchart, or, as the English term it, the Race of Alderney. The northern coast from Cape la Hogue to Pointe Barfleur, the north-eastern point of the rectangle, forms a shallow bay, at the bottom of which are the roadstead and town of Cherbourg. The roadstead is defended by a digue, or breakwater, having a small island at each end: that at the east end is called Pelée. Near Cherbourg the coast is high and abrupt. From Pointe Barfleur the coast runs southward in an irregular line to the æstuary of the Douve and the Vire, which is full of shoals. This eastern coast is skirted above highwater-mark by a marshy flat a mile and a half broad in some places, along the immediate margin of the sea by sandy-downs, and below highwater-mark by broad sands and rocks; it has opposite to it the small island of St. Marcouf.

The department has not any mountains, but a range of hills, some of them of considerable height, branching from the Armorican chain, extends through it from south to north. The principal streams flow from these heights eastward or westward into the sea, owing to the proximity of which all the watercourses are short.

The primitive rocks overspead the greater part of the department, but a part of the eastern coast and of the country about Valognes, Carentan, and St. Lô is occupied by later formations. Between Carentan and Valognes the elevated tract behind the low marshes that skirt the shore is composed of blue lias, which extends to a considerable distance inland. This lias closely resembles, in its fossil remains, that of the south of England; the white and blue strata are commonly much intermixed. The new red sandstone is abundant between Carentan and St. Lô; it is chiefly composed of red marl and red sandstone mixed with the usual blue and white strata; between Carentan and Isigny it is yellowish mixed with red and grey, and is tolerably compact. Red marl and red sandstone belonging to this formation are found near Valognes and along the coast intermingled with gravel beds composed of the rocks of this formation, intermixed with quartz rock, on which in several places the new red-sandstone is found to rest. This quartz rock has in some parts been denuded; it is found between Valognes and Cherbourg alternating with argillaceous slate. Argillaceous slate and grauwacké occupy the east of the department about St. Lô. Granite, resembling that of Dartmoor, is found at St. Vaast near Pointe Barfleur.

A bed of limestone, probably belonging to the supracretaceous rocks, is quarried between Carentan and Valognes; and another limestone of uncertain date is found in the immediate vicinity of the latter place (*Geol. Transact.*, 2nd series, vol. i.)

The mineral treasures of the department are not great. There is one iron-work, having one furnace for making pig-iron, and one forge for wrought-iron. No coal is procured, but granite, slates, and stones for millstones and whetstones are quarried; kaolin and potters' earth are procured; and there are some mineral springs, and in the marshes considerable salterns.

The largest river is the Vire, which rises in the department of Orne, and enters this department on the east side near Tessy, from whence it flows northward, just within and in one part on the boundary of the department, past St. Lô into the English Channel. The whole length of the Vire is about 50 miles, for about eight of which it is navigable. The Douve rises near the west coast of the peninsula of Cotentin, across which it flows in a winding channel to the eastward, until it falls into the same inlet or æstuary as the Vire. Its whole length is about 34 miles, for above half of which it is navigable. The Merderet and the Sève, small feeders of the Douve, about 12 miles long, are navigable the first for about four miles, the second for about th and the Taute, another small feeder of the same river, 20 or 22 miles long, is navigable for about 14 or 15 miles. The Sinope and the Saire run into the sea on the east coast; the Divette, at Cherbourg on the north coast, and the Ay on the west coast: these are all small. The Sienne rises in the department of Calvados and flows north-west across the department into the sea; its length is about 38 or 40 miles, of which only five are navigable. Its principal feeder is the Soulle, which flows by Coutances; the Airon and the Venne are smaller. In the south of the department are the Celune, or Selune (34 miles long, with five miles of navigation), which rises in the south-eastern side of the department, and flows across it into the sea opposite Mont St. Michel, receiving in its course the Deron, the Brevon, and the Oir; the Sée (28 to 30 miles long), which falls into the sea near the Celune; and the Couesnon [Ille et Vilaine], of which only a small portion, including a navigation of five miles, belongs to the department.

The Terette and the Madelaine, two streams to which the government returns assign a navigation of four and five miles respectively, are not marked, at least under those names, in Brué's map. The total amount of inland navigation is about 75 miles.

The number of Routes Royales, or government roads, is eight, of departmental roads 23; together 31. The aggregate length of the government roads was (1st Jan., 1837) 227 miles, of which 213 miles were in repair, 11 miles out of repair, and three miles unfinished. The aggregate length of the departmental roads was 360 miles, of which 201 were in repair and 159 out of repair. The principal road is that from Paris to Cherbourg, which enters the department on the east at the village of Anville on the Vire, between Isigny (Calvados) and Carentan, and runs through Carentan, Sainte-Mère-Eglise, and Valognes. The road from Paris to St. Lô branches off from the foregoing at Bayeux (Calvados) and entering the department on the east, at St. Quentin on the Elle, a small feeder of the Vire, runs to St. Lô. The road from Paris to Avranches branches off from the Cherbourg road at Caen and runs through Villedieu. Roads run from St. Lô northward to Carentan; westward to Coutances, where it joins a road from Carentan to Granville; and southward to Villedieu, where it joins the road from Paris to Avranches. Roads run from Granville to Villedieu and to Avranches; and from Avranches to Pontorson on the Couesnon and so into Bretagne. A road from Caen (Calvados) to Rennes (Ille et Bretagne) crosses the south-eastern corner of the department through Mortain and St. Hilaire. The bye-roads and paths amount to nearly 14,000, with an aggregate length of nearly 10,000 miles.

The arable land of the department comprehends nearly two-thirds of the whole soil; the corn grown exceeds the consumption of the department and the average produce of the departments of France, especially in buckwheat and barley; more buckwheat is grown than of any other grain; the quantity of oats, rye, and maslin or mixed corn raised is small. Flax and hemp are raised in great quantity. Pulse is good; the fruit is of middling quality. The quantity of ground occupied for orchards is perhaps greater than in any other department; the apples are grown for making cider. The quantity of meadow-land is also very considerable, nearly one-sixth of the whole department; horses and horned cattle are very numerous, and the cattle are of one of the finest breeds in France. The proportion of cows is great, and a large quantity of butter is exported. The breed of sheep is not very good; it is considered that the long woolled Leicester breed might be introduced with great advantage. The rearing of swine, poultry, and bees is in some parts an object of great attention. There are no vineyards and but little woodland; the forest trees are chiefly oak, beech, and birch.

The department is divided into six arrondissements, as follows:—

		Area in square miles.	Population in 1831.	Population in 1836.	Communes.
Saint Lô	E.	436	99,250	100,717	120
Coutances	W.	512	136,847	135,980	137
Valognes	N. and Central	401	95,660	95,950	118
Cherbourg	N.	233	75,488	76,673	73
Avranches	S.W.	379	110,468	110,821	124
Mortain	S.E.	337	73,571	74,241	73
		2,298	591,284	594,382	645

There are 49 cantons, or districts, each under the jurisdiction of a justice of the peace.

In the arrondissement of St. Lô are, St. Lo (pop. in 1831, 8154 town, 8421 whole commune; in 1836, 9065 commune) [Lô, St.] and Tessy, on the Vire; Thorigny, or Torigny (pop. 2121 town, 2184 whole commune), and Cericy, in the country east of that river; Guilain, near the source of the Venne; Canisy and Marigny, near St. Lô; and Carentan, at the junction of the Taute and the Douve. Thorigny had formerly a fortress, built during the occupation of Normandie by the English, on the site of which was erected a magnificent mansion, of which only one wing remains. Carentan (pop. 2292 town, 2773 whole commune), situated in a marshy and unhealthy district, is surrounded by ruined walls and defended by a strong castle. Trade is carried on in corn, cider, hemp, flax, honey, butter, fish, cattle, and horses. There are some manufactures of lace and cotton.

In the arrondissement of Coutances are, Coutances (pop. in 1831, 8957; in 1836, 7663 for the commune) [Coutances] and Cerisy-la-Salle, on the Soulle; Hambie, or Hambye (pop. 3684), St. Denis, Gavray, and Cerences, on or near the Sienne; Brehal, in the country south-west of that river; Périers, near the Taute; Créance and Lessay, on or near the Ay, the mouth of which forms a small harbour; La Haye-du-Puits, on the Houillabec, a small feeder of the Douve; and Pretot, between La Haye-du-*Puits* and Carentan. Cerisy-la-Salle has a manufactory of calico, and near Créance and Lessay are considerable salterns. The sailors of Agou, a village of 1500 inhabitants, at the mouth of the Sienne, which forms a small harbour, are engaged in the Newfoundland cod-fishery.

In the arrondissement of Valognes are, Valognes (pop. in 1831, 6338 town, 6940 whole commune; in 1836, 6655 commune), Montebourg (pop. 2423 town, 2523 whole commune), Sainte-Mère-Eglise, and Le Homme, on or near the Merderet; Bricquebec (pop. 4255), St. Sauveur, and Pont l'Abbé, on or near the Douve; Barneville, on the haven of Carteret on the west coast; and Barfleur, Tatihou, Saint-Vaast (pop. 3502), Quettehou, and La Hougue, on the eastern coast. Valognes is pleasantly situated in a valley. It is said to have owed its origin to the destruction by fire of an antient city close by, which Malte Brun and others, misled probably by the modern name of the commune in which its ruins stand (Allaume), suppose to have been the Alaune of the antients, but which M. D'Anville considers, and with better reason, to have been Crociatonum, the chief town of the Veneli, or Unelli. There was antiently a strong castle at Valognes, which was taken by Bertrand du Guesclin (A.D. 1364) from Charles le Mauvais, king of Navarre. The town was several times taken and retaken during the wars of the English in France, under Henry V. and VI.; and was again the object of contest in the civil wars of the sixteenth century, and in the troubles of the minority of Louis XIV. The inhabitants manufacture porcelain, felt, cotton-yarn, and lace; there are dye-houses and tan-yards; and trade is carried on in linens, gloves, and paper. The manufacture of woollen-cloth, once flourishing, has gone to decay. There are a public library, a high-school, an agricultural society, and a poor-house or hospital, by the inmates of which lace is made.

In the arrondissement of Cherbourg are, Cherbourg (pop. in 1831, 18,377 town, 18,443 whole commune; in 1836, 19,315 whole commune) [Cherbourg], on the sea, at the mouth of the Divette; Les Pieux, near the west coast; and St. Pierre-Eglise (pop. about 2300), near the north coast, between Cherbourg and Pointe Barfleur. At Saint-Pierre-Eglise is a large linen manufactory, and at the village of Tour-la-Ville (pop. 3624) near Cherbourg are slate quarries; there were formerly extensive glass-works here. At St. Vaast, near St. Pierre-Eglise, cotton-yarn and calico are manufactured.

In the department of Avranches are, Avranches (pop. in 1831, 7000 town, 7269 whole commune; in 1836, 7690 commune) [Avranches] and Brecey, on the Sée; Villedieu (pop. 3074 town, 3095 whole commune), on the Sienne; La Lande, on the Airon; La Haye-Pesnel and Sartilly, in the country north of the Sée; Granville (pop. 7350) [Granville], Genest, and Pontorson, on or near the west coast; Ducey, on the Celune; and Saint-James (pop. 1790 town, 3104 commune), on the Brevon. Villedieu owes its origin to a grant of the territory in which it stands, made by Henry I. of England, duke of Normandie, to the Hospital of Jerusalem. The village, which rose on the possession of of the Hospitallers, called Theopolis, or God's town (in French, Ville Dieu), grew to a town. It is a busy place; there are copper-foundries, brass and earthenware manufactories, and a hair-cloth manufactory. Leather and lace are made; the latter chiefly by women. Pontorson is on the Couenon, or Couesnon, near the border of the department. The inhabitants trade in linen and lace. The latter, which is of excellent quality, is made in the hospital or poor-house, and affords employment and subsistence to a considerable number of poor. Saint-James is built on a hill, surrounded by valleys which present very picturesque and varied scenery. It is of uncertain origin; but the extent of the circuit of the walls, and the number of subterraneous vaults which yet remain, show it to have been formerly a place of greater importance. It was repeatedly taken and retaken in the wars with the English. There are several manufactures, and at the nine yearly fairs considerable business is done in linens, woollen stuffs, and thread.

In the arrondissement of Mortain are, Mortain (pop. in 1831, 1922 town, 2511 whole commune; in 1836, 2521 commune) and Juvigny, between the Sée and the Celune; Barenton (pop. 3106), near the Celune; St. Hilaire-du-Harcouet (pop. 2064 town, 2759 whole commune), on the Deron; Le Teilleul, in the country south of the Celune; and St. Pois, in the country north of the Sée. Mortain is in one of the most hilly tracts in the department. The only manufacture is that of earthenware. At St. Hilaire-du-Harcouet there is a college or high-school.

The population, where not otherwise specified, is that of the commune, and from the census of 1831.

The manufactures of the department are woollen cloths, serges and other stuffs, linens, lace, cotton yarn and goods, haircloth, earthenware, glass, wax candles, ironmongers' and other hard wares, common cutlery, paper, leather, and soda from sea-weed. There are in the arrondissement of Valognes two establishments for the manufacture of sheet-zinc, zinc pipes, zinc nails for sheathing ships, &c. There are several ship-building yards and salterns on the coast. The coast and Newfoundland fisheries are actively pursued, and much trade is carried on with the Anglo-Norman Isles, Guernsey and Jersey.

The department forms the diocese of Coutances, the bishop of which is a suffragan of the archbishop of Rouen. It is in the jurisdiction of the Cour Royale and the circuit of the Académie Universitaire of Caen; and in the fourteenth military division, the head-quarters of which are at Rouen. It sends eight members to the Chamber of Deputies.

In respect of education, this department is rather above the average of France. Of every hundred young men enrolled in the military census of 1828-29, forty-three could read and write, the average of France being thirty-nine. There are seven Collèges Communaux, or district high-schools, and two schools of navigation.

This department constituted in antient times the country of the two Celtic people, the Abrincatui and the Unelli or Veneli. Ingena, the capital of the former, from whom, in the fourth century, it took the name Abrincatui, is the modern Avranches; and Crociatonum, the chief town of the latter, was near the modern Valognes. Cerialtum was probably at the little haven of Gouril, near Cape la Hogue; and Alauna at Les Moutiers d'Alonne, near the haven of Carteret. Cosedia, which some have endeavoured to prove was the same as Constantia, the modern Coutances, was probably near the harbour of St. Germain. Fanum Martis was perhaps Mont Martin-sur-Mer, near the mouth of the Sienne; and Legedia was perhaps on the west coast, at the little haven of Lingreville, near Granville, which last place may be probably identified with the Roman Grannonum. Augustodurus, a Roman town mentioned in the Peutinger Table, was probably on the Vire, not far from Mont-Martin-en-Graignes. The æstuary of the Douve and Vire is probably the Argenus of Ptolemy, if that geographer speaks of a river, not a town; and the Tetus of the same writer was probably either the Sée or the Célune.

In the middle ages the department constituted the districts of Cotantin and Avranchin. They were among the tracts ceded by Charles le Simple to the Northmen, and formed part of the duchy of Normandie. It was the part of Normandie which the English retained the longest.

MANCHESTER is situated in the hundred of Salford and the county of Lancaster, 168 miles N.W. by N. of London, direct distance, or 187 miles by the present mail-coach road. The parish, which comprises several townships, had in 1773 a population of 13,786, and in 1831, 270,363, of which there were in the township of Manchester 142,026. From 1801 to the last census, in 1831, the population had more than doubled itself; nor has the increase come to a stand. In Pigot's 'Manchester and Salford Directory,' for 1829, were given 34,200 names of resident housekeepers; in that for 1839 above 44,000: in the former the number of streets was 2740; in the latter 3620. Under the Reform Act Manchester sends two members to parliament. In the first election (1832), contested by five candidates, there were given 9689 votes; in the election in 1835 four candidates received 9636 votes.

Under the Municipal Act the borough has a commission of the peace, is divided into fifteen wards, has a mayor (Thomas Potter, Esq., the first mayor), sixteen aldermen, and forty-eight councillors, whom the act empowers to hold a Court of Record for the trial of civil actions, provided the sum or damages sought to be recovered do not exceed twenty pounds. Under the same act the borough has also a commission of the peace and the right of holding quarter-sessions.

The town is not distinguished for architectural beauty; its chief streets are occupied with warehouses and shops, the more and the less opulent inhabitants residing, at a greater or less distance from the centre of the town, in dwellings separate from those in which they conduct their business, many of which are spacious and beautiful. There are however some objects of architectural interest in Manchester. Under the sanction of acts of parliament much has been done for the improvement of the town, both in convenience and appearance. Market-street, the chief mart for retail business, was not many years ago a mere lane: it is now a very handsome street. The improvement was completed in 1834, when the total outlay was 232,925*l.* The Manchester Improvement Committee have also judiciously applied the profits of the gas-works, which are in the hands of the Commissioners of Police, to the improvement of the township: 20,057*l.* were thus expended by them in the year 1835. Among the public buildings worthy of notice may be named the chaste portico of the Subscription Library, and the truly classic and handsome Royal Institution, both in Mosley-street, and the hall of the Museum in Peter-street. The Infirmary is a fine building, and has an advantage which is rare in Manchester, namely, that of being in a favourable situation. Several new churches have recently added to the appearance of the out-districts of the town, among which the churches at Pendleton and Hume deserve special mention: but even these are inferior to the beautiful church in the pointed style now (1839) being erected by Mr. Atkinson, architect, near Smedley-lane, Cheetham Hill.

Situation and Inland Communication.—Manchester stands on the south-east bank of the river Irwell, by which it has a communication with the Mersey, Liverpool, and the ocean. It is situated in a district which contains some of the best coal strata of England, a circumstance to which the place is in no small degree indebted for its prosperity. The weekly consumption of coal in the town and neighbourhood is estimated at 26,000 tons, the charge of which is for the factories about 8*s.* per ton, for private houses 12*s.* per ton. In 1836, 913,991 tons were brought into Manchester.

The climate of Manchester is not so genial as that of the more southern districts of the kingdom; but the unfavourable impression which prevails respecting it is much exaggerated. The following statements are made on the authority of Dr. Dalton (*Memoirs of the Manchester Philosophical Society*, second series, vol. iii., p. 483, et seq.). The mean height of the barometer at Manchester is 29·85. The mercury is higher in the summer months than in the winter. The general annual mean of temperature is nearly 49°. The mean annual fall of rain is 36·140 inches; while at Lancaster it is 39·714, at Dumfries 36·919, and at Kendal 53·944. The first six months of the year must be considered as dry months, and the last six months as wet months. April is the driest month in the year, and the sixth after, namely, October, is the wettest, or that in which the most rain falls, in a long continued series of years, in the immediate neighbourhood of Manchester.

Manchester has the credit of having given an impulse to our means of internal communication, and has reaped an ample reward. The achievements of Brindley were prompted by the desire which the duke of Bridgewater had of sending his coal from Worsley to Manchester at a small expense. [BRINDLEY.]

Manchester now possesses the means of water-communication with almost every part of the country. In the railroad enterprise Manchester has held a prominent station. It furnished its full share of the capital employed in the formation of the Manchester and Liverpool railway, the act for which was obtained in May, 1826; the road was completed by Midsummer, 1830, and formally opened on the 15th of September of the same year, in the presence of half a million of people assembled along the line. By the Report of the directors, dated January, 1839, declaring a dividend of 5*l.* per cent. for the half-year previous, it appears that the receipts within that period were as follows:—Coaching department, 79,277*l.*; merchandise, 54,215*l.*; coal, 3201*l.*: total, 136,693*l.* The expenses were 80,978*l.*, leaving a balance for distribution among the proprietors of 55,714*l.* The amount of expenditure in construction of the way and works is stated at the enormous sum of 1,376,073*l.* for a length of road only thirty miles. The Manchester and Bolton railroad was formally opened on the 26th of May, 1838. Its length is ten miles, and its cost 650,000*l.* A continuation of the line to Preston and Lancaster is in progress. A dividend of 1*l.* 10*s.* per share was declared on the 9th of January, 1839. The Grand Junction railway connects Manchester with Birmingham and London: there are 10,918 shares in this railway, and the outlay was 1,512,150*l.*; it was opened in September, 1837, and has paid on the first year 10*l.* per share, on the last six months 12*l.* The North Union connects Manchester with Wigan and Preston. There are also in course of formation lines to Leeds, direct to Birmingham, to Sheffield, &c.

History.—Manchester, as its name shows (Man, castra), was a Roman station, the Mancunium of the Antonine Itinerary. Aldport, the original of Manchester, is supposed by the learned Whitaker to have taken its rise in the reign of Titus, and during the continuance of the Romans in this island it was indebted to them for many of the germs of civilization, and especially for an improvement in the woollen manufacture, a branch of trade which is said to have been introduced from Gaul before their invasion. Of the roads which were planned by Agricola, Manchester had four; two running from east to west, and two from north to south: inferior stations, at places now known by the names of Singleton Brook, Prestwich, and Broughton, were connected with the Manchester camp. Under the Saxons Manchester became the abode of a Thane, who from his baronial hall dispensed a certain sort of justice, and furthered the improvement of the place. At an early period it had two churches, one of which, St. Michael's, is mentioned in Domesday Book. In 870 the Danes got possession of Manchester. After the Norman conquest William gave the place to William of Poictou. The third baron of Manchester was concerned in wresting Magna Charta from King John. In the year 1301 Thomas de Grelley granted the 'Great Charter of Manchester.' In 1307 the baron of Manchester was summoned to parliament, and appears to have been a favourite with Edward I., who made him Knight of the Bath. From the Grelleys the barony descended to the family of De la Warre, and John, the first of the line, was called to parliament in the ninth year of Edward II. He and his successors distinguished themselves in the battle of Cressy, during the Wars of the Roses, and most of all at the period of the Reformation, the baron of Manchester being one of those who apprised the pope that his continued resistance to Henry's wishes in regard to the divorce would lead to the extinction of his supremacy in England. At length the manorial rights vested in the family of 'Mossley of the Hough.'

The dissensions excited by the Reformation were strongly experienced in this town. Collyer, the warden of the collegiate church, refused to acknowledge the spiritual supremacy of Henry VIII., and many of the great families in the neighbourhood remained for a long time attached to the see of Rome. In the civil wars Manchester ranged itself on the side of the parliament (Puritanism having gained an ascendancy in it), and sustained a siege conducted by Lord Strange. On the cessation of the contest, Presbyterianism replaced Episcopacy; Heyrick, the warden of the collegiate church, being himself instrumental in bringing about the change. In 1646, when Lancashire was converted into an ecclesiastical province under the Presbyterian forms, Manchester, with some neighbouring places, was constituted the first classical division of the county. Under Cromwell the electors chose a representative in the person first of Mr. Charles Worsley, and then of Mr. R. Ratcliffe. The Act of Uniformity under Charles compelled about seventy ministers to quit their livings in Lancashire, and among others, the Rev. H. Newcombe, who became minister of what is now called Cross-street chapel, and may be considered the father of non-conformity in a town which has from the first been distinguished as possessing 'a greater dissenting population than most others in the kingdom.' A strong Jacobinical feeling soon grew up, and the Rebellion of 1745 had many friends and supporters in Manchester, even among the leading inhabitants and the clergy of the collegiate church. Prince Charles himself was entertained in the town at the residence of Mr. Dickinson, in Market-street, a house subsequently known as an inn, under the title of the 'Palace,' and which has recently been pulled down to give place to warehouses. It was not till 1783 that the town had a nightly watch, nor did it possess a Police Act before 1791. The political strife which characterises the last half century, and by which great changes have been effected in the constitution of the country, displayed itself at a very early period in Manchester, and was supported and extended by means of 'Reform Clubs' and 'Church and King Clubs.' In 1791 a 'Constitutional Club' was formed. The threat of a French invasion excited indignation and much warlike display. Immediately after the peace in 1815, the desire for 'Reform' began to manifest itself in Manchester in a very decided manner. By the Reform Act Manchester obtained, in common with many other towns in the kingdom, the elective franchise.

Manufactures.—Cotton is the chief article employed in the manufactures of Manchester. Of late the spinning and weaving of silk have been introduced, and it has manufactures of woollen, small wares, hats, umbrellas, and of machinery, which last has risen to great importance and perfection.

The commercial spirit dates back to a very early period. It is enough however to mention, that in the time of Henry VIII. and Edward VI. the town was distinguished for its manufactures. The more rapid expansion of trade began in the seventeenth century, and one who is known as a benefactor to the town, Humphrey Chetham, was among its most eminent tradesmen. The enormities of the duke of Alva in the Netherlands, and subsequently the revocation of the edict of Nantes, brought many enterprising and skilful foreigners into the district, and gave energy and effect to the native commercial impulse. At first the woollen was the only branch of trade, but since the middle of the last century the cotton business has nearly superseded the antient fabric. The natural advantages possessed by the town, together with the strength of character of the natives, was undoubtedly the original and the main cause of the growth of its trade and prosperity; but the series of brilliant inventions and discoveries applied, improved, or originated in the district of Manchester, which comprise the steam-engine, the spinning-jenny, the mule-jenny, the fly-frame, the tube-frame, the mule, &c., have proved most effective instruments in aiding the development. The early series of inventions which gave energy to the cotton manufacture were completed about 1780. Before their introduction—namely, until 1751—the importation of raw cotton into this country had gone on increasing slowly; the supply being in 1701, 1,985,868 lbs.; and in 1751, 2,976,610 lbs. But in 1780 it had increased to upwards of 6,700,000 lbs.; while in 1800 it reached 56,000,000 lbs. Equally striking is the official return of the export of cotton goods: in 1701 the value was 23,253*l.*; in 1800, 5,406,501*l.* Again, in 1838, the following, according to Burnd's 'Commercial Glance,' was the amount and value of manufactured cotton goods exported:—

	lbs.	£.
In manufactured goods .	120,784,629	11,746,475
In yarn . . .	113,753,387	6,043,138
In thread . . .	2,361,984	177,224
	236,900,000	17,966,837

The value of the cotton trade to the country has been estimated at 34,000,000*l.* annually; the capital employed at 20,000,000*l.*; the amount of wages annually paid, 17,000,000*l.* and that 1,500,000 people depend on it for their subsistence. Till within the last year or two, the progress has been steady and rapid; it is not however easy to affirm that it will continue as satisfactory; at the moment we write

, 1889), numerous mills in Manchester and the ›urhood have ceased working, in part or altogether. processes of throwing and weaving silk were extenarried on at Macclesfield several years before they . Manchester. The silk-mill of Mr. Vernon Royle, in 1819-20, was the first brought into operation in er town. Since then the trade has rapidly increased. there were in it about a thousand weavers of mixed l cotton, and fifty of pure silk goods; in 1836 there the county (Manchester being the principal locality) two throwing-mills employing about four thousand . Printing is another branch of the silk business, if not exclusively, carried on at Manchester. Dyeilk is also extensively pursued, and in fact the town ning the centre of transactions in the silk trade.

erty in Manchester has greatly increased in value, and its of the manufacturers have undergone an entire It is curious to contrast the picture which Aikin ith what is now seen in the stupendous warehouses mansions and palaces which are found in Manches- . its vicinity. 'An eminent manufacturer in that 95) used to be in his warehouse before six in the g, accompanied by his children and apprentices. At hey all came to breakfast, which consisted of one sh of water-pottage, made of oat-meal, water, and a lt, boiled thick, and poured into a dish. At the side an or basin of milk, and the master and apprentices, th a wooden-spoon in his hand, without loss of time, into the same dish and thence into the milk-pan, soon as it was finished they all returned to their 'When the Manchester trade began to extend, the n used to keep gangs of pack-horses and accompany the principal towns with goods in packs, which they and sold to shopkeepers, lodging what was unsold l stores at the inns.' In 1816 the annual value of y in the township of Manchester was 405,986*l.*; in had reached 573,085*l.* In the township of Ardoperty had in 1836 nearly doubled in the short space years: in that of Chorlton-on-Medlock, a town hin a few years been actually created through the of factories; in 1801 its population was 675, in 1831 in 1815 the annual value of property was 84,844*l.*, and , 117,688*l.* Nor need there be any surprise felt at this is known that mills of the first character require an of from 50,000*l.* to 100,000*l.* In the reign of William ry the taxable property in Manchester was rated at in the year 1828 the amount of assessed taxes l was 25,420*l.* The circulation of the branch bank land in Manchester, which in 1828 was 258,000*l.*, en to 1,520,000*l.* in 1837, though in the interval seint-stock banks had been established. In 1794 the ate at five shillings in the pound produced 9270*l.*, it realised on a rate of half-a-crown 44,896*l.* In was mentioned as an extraordinary fact that Manpaid in postages 11,000*l.*, being a larger amount ny other provincial town; in 1838 this sum had 69,232*l.* In the single article of bricks the aid to the excise in 1835 no less a sum than . The value of land has undergone a proportional e, as may be judged of by the following sales made of the central parts of the town: in 1834, 71 square yards Street were bought for 354*l.*; 50 yards at the corner Street for 280*l.*; 250 yards in Smithy Door for even 9*l.*, 10*l.*, 15*l.*, and yet higher sums have been er square yard for land in situations eligible for those se receptacles of goods, the larger warehouses. Land upper end of Market Street and Mosley Street, which s ago was sold for 4*d.* per square yard annual rent, has ld for 20*s.* a yard annual rent.

the intellectual and moral condition of the working there has doubtless been great exaggeration, but it lly true that in that condition there is much to . The prevalence of the factory system has broken old domestic manufacture and thereby destroyed old ic habits; it has also called from every district of the m, and especially from Ireland (there are at least Irish in Manchester), masses of people heterogeneous r character, yet all more or less ignorant and uncultiand not likely therefore to coalesce speedily into a t form of civilised existence. Most of them have uch bettered in their circumstances without having an equal increase of morally improving influences. en by the amount of their wages have become independent of their parents; girls have been sent into the mill before they have learnt the rudiments of domestic duty, and mothers, whose presence in their own houses is indispensable, work for twelve hours in the day amid a mass of people young and old, with whom they have little or no connection, and from whom in consequence they can scarcely derive any improvement. It must also be said that the atmosphere of the factory is unnatural and consequently unhealthy, while the degree of heat tends to the premature development of the passions, and, as the least baneful consequence, to early, improper, and improvident marriages. The charges against the factories, of being the scenes of violence and cruelty to children, of extortion against the men, as destructive alike of life and morality, may be considered as gross extravagances or little better than falsehoods: but it is not the less true that neither their moral nor their physical atmosphere is favourable to the well-being of the work-people; that, with some honourable exceptions, the masters are disregardful of the comforts and improvement of those whom they employ, and think exclusively of the wealth they can extract from their establishments, and that thus there has arisen on the part of the workmen a feeling of jealousy, of dislike, of sullen discontent, which, added to other depraving influences, makes their moral tone hard, disposed to violence, and almost reckless, while their congregating together in masses gives them opportunities of communicating their feelings one to another and of concentrating their power. The system has not been sufficiently long in general operation to afford accurate means of judging of its effect on health and life; it has also been tried, in relation to these matters, under favourable circumstances, since there has been a continual influx of fresh population to the mills from rural districts or small towns, and therefore statistical tables cannot furnish any adequate means of forming an opinion; but in relation to children, the wonder is, that any one should have doubted of the injurious influence which it has upon their health and consequently on their character. As it is, the moral condition of the young, and of the homes whence they come, are in very many cases bad. When the mother is in the factory, the home must be in disorder. When parents subsist on the earnings of their children, as in many instances, the relations of domestic life are subverted; the weak labour, the strong are idle, idleness begets vice, vice is the parent of discontent, and this leads to the use of intoxicating drinks; the parent is moreover punished in the disobedience, if not insolence, which soon manifests itself on the part of the children, who are well aware how much the family depends on their earnings. Of 63,623 persons employed in mills, May, 1836, in the parish of Manchester, 35,283 were females; 37,930 were above the age of 18 years, and 16,965 were below the age of 15. The following table gives the average net weekly earnings of the different classes of operatives in the cotton factories of Manchester, Stockport, Duckinfield, Staley-bridge, Hyde, Tintwistle, Oldham, Bolton, &c., drawn from the Returns of 151 mills, employing 48,645 persons, in May, 1833:—

Denomination of process in which employed.	Class of Operatives.	Classification as respects age and sex.	Average weekly net earnings.	
			s.	*d.*
Cleaning and spreading cotton	. . . . .	Male and female adults, and some non-adults	3	8
Carding . . .	Carders or overlookers	Male adults	23	6
	Jack-frame tenters	Principally female adults .	8	0
	Bobbin-frame tenters	Do. do. .	7	5¼
	Drawing tenters	Do. do. .	7	5½
Mule spinning .	Overlookers .	Male adults	29	3
	Spinners . .	Male and female adults, but principally the former	25	8
	Piecers . .	Male and female adults and non-adults, but principally the latter	5	4½
	Scavengers .	Male and female non-adults	2	10¾
Throstle spinning	Overlookers .	Male adults	22	4¼
	Spinners . .	Female adults and non-adults	7	9
Weaving . .	Overlookers .	Male adults	26	3¼
	Warpers . .	Male and female adults .	12	3
	Weavers . .	Male and female adults, male and female non-adults, but chiefly females	10	10
	Dressers . .	Male adults	27	9¾
Reeling . .	Reelers . .	Female adults and non adults	7	11¼
Roller-covering	Roller-coverers	Male and female adults .	12	1½
Attending the steam-engine and making machines .	Engineers, firemen, mechanics, &c.	Male adults	20	6

If this table were combined with the relative numbers of each description of the hands, it would afford the absolute average of their earnings, but it is beyond a doubt that the average is not less than 10 shillings a week each person, young and old. It will be noticed that the lowest wages are given to the scavengers and piecers, who are generally young children. Out of a family of six persons there may be three, out of seven persons four employed at the factory, and when in a few years the children are become older, all may be so engaged. This will give for each of such families an average earning of 30*s.* or 40*s.* per week, when only three or four out of each family are employed, which would be amply sufficient to provide all the necessaries of life. The splendid gin-palaces, the numerous beer-houses in Manchester, make it but too obvious where the superfluous means of many go, and point out a source of demoralisation which is as frightful in its consequences as in its amount. But there are other signs which indicate anything but a want of means on the part of the great bulk of the population. The last Report of the Manchester and Salford District Provident Society shows that in 1837, though trade was not good, the amount received by its agents, who visit the houses of the work-people and take their savings in very small deposits, was 4735*l.*, while the Savings' Bank received within the year ending November, 1838, no less a sum than 109,123*l.* The following tables will furnish the reader with the means of judging how much of this came immediately from the operatives:—

Classification of Depositors, November 20, 1838.

	Male.	Female.	Total.
Tradesmen, shopkeepers, artificers, publicans, or their wives	9206	2568	11,774
Persons employed in factories, warehouses, or as porters, &c.	4789	845	5634
Domestic servants	930	5370	6300
Widows	——	997	997
Minors	2083	1856	3939
Weavers	1332	389	1721
Labourers	864	——	864
Farmers	473	85	551
Other descriptions not particularly specified	1382	2468	3850
			35,637
Friendly societies			77
Charitable societies			189
			35,903

CLASSIFICATION OF SINGLE DEPOSITS, 1838.

£ s. d.	Not exceeding £ s. d.	1st Yr.	2nd Yr.	3rd Yr.	4th Yr.	5th Yr.	6th Yr.	7th Yr.	8th Yr.	9th Yr.	10th Yr.	11th Yr.	12th Yr.	13th Yr.	14th Yr.	15th Yr.	16th Yr.	17th Yr.	18th Yr.	19th Yr.	20th Yr.	21st Yr.	T
		1818	1819	1820	1821	1822	1823	1824	1825	1826	1827	1828	1829	1830	1831	1832	1833	1834	1835	1836	1837	1838	
Deposits of 0 1 0	0 5 0	357	403	245	348	422	606	762	991	521	757	1116	950	1132	1020	936	1011	936	970	1059	1016	1806	[illegible]
Above 0 5 0	0 10 6	94	131	72	162	196	464	597	806	390	748	1035	963	1371	1026	939	1022	1270	1492	1598	1256	2195	[illegible]
.. 0 10 6	1 1 0	192	281	185	350	459	763	876	1481	767	1158	1684	1722	3184	2006	1701	1713	2294	2930	3103	2354	3374	[illegible]
.. 1 1 0	5 0 0	263	545	461	763	1207	1681	1983	3573	1876	2850	3834	3706	4328	4109	3694	4361	5393	6229	6843	5241	7617	[illegible]
.. 5 0 0	10 0 0	81	154	146	318	452	637	779	1417	735	1173	1627	1307	1706	1577	1449	1533	1918	2281	2595	2066	2717	[illegible]
.. 10 0 0	20 0 0	55	107	119	190	258	389	512	820	560	731	1078	817	966	948	925	896	1063	1292	1478	1224	1386	[illegible]
.. 20 0 0	30 0 0	24	38	29	63	104	152	203	365	497	623	829	637	772	674	703	670	742	915	1008	910	1079	[illegible]
.. 30 0 0	40 0 0	11	13	14	31	37	73	120	138	10	5	8	8	19	23	25	12	10	26	15	24	226	[illegible]
.. 40 0 0	50 0 0	8	18	13	22	39	93	128	170	3	6	1	7	10	16	19	2	5	16	9	14	19	[illegible]
.. 50 0 0	100 0 0	14	21	15	40	59	89	146	65	10	14	17	24	19	28	31	15	18	16	10	18	20	[illegible]
Exceeding £100 . . .		..	..	..	..	..	1	1	7	4	13	3	11	..	..	..	..	..	7	6	1	15	[illegible]
		1099	1711	1299	2287	3233	4948	6107	9833	5373	8078	11,232	10,152	12,507	11,427	10,422	11,235	13,649	16,174	17,724	14,134	20,453	[illegible]

The deposits stated as exceeding £30 since the eighth year, 1825, are not new deposits, but transferred by gift, decease, or otherwise, from old accounts to new ones.

Not merely the factory hands, but generally all classes of working men have been in the receipt of wages sufficient, if well laid out, to procure all the necessaries and many of the comforts of life. Yet for want of the proper moral training, and by reason of the demoralising influence of Irish and other uneducated labourers, the abodes of a large proportion are wretched. Of 4102 dwellings, of which the Manchester Statistical Society gave a Report in 1834, founded on personal inspection, 3100 were houses, 752 cellars, 250 rooms; of these there were comfortable 1551, well furnished 689, not comfortable 255.1.

In 1838 the Society issued another Report of 28,186 dwellings examined.

Persons occupying	houses . . .	94,250
Do. do.	rooms of houses .	9,351
Do. do.	boarding with occupants of houses	9,671
		113,272
Persons occupying	cellars . . .	14,274
Do. do.	boarding with occupants of cellars	686
Total number of persons resident in the dwellings examined		128,232

Of the 28,186 dwellings, 14,042 are reported as ill-furnished and 8322 as not comfortable; thus only 72 per cent. of the houses of the working population of Manchester and Salford are comfortable. The Report adds, 'As in many (perhaps in the majority of cases) there are only *two* beds to a family of five or six persons of both sexes, the inconveniences and evils which must result are too obvious.'

The following is an extract from the Report for 1838 of the Manchester and Salford Town Mission, which, making allowance for the rhetoric of the style, affords a true picture of the condition of many: 'Those who only visit occasionally the dwellings of the poor can have no idea of the state of ignorance, superstition, demoralisation, and infidelity which exists. This is only to be discovered by those who visit them constantly and regularly, as our missionaries do. Scenes most disgusting and blasphemy at which the mind shudders are patiently borne and fearlessly met by the agency we employ. They (the town missionaries) have been stoned, threatened with death, surrounded with mobs, seriously bruised, and more than once they have narrowly escaped with their lives. And this in Manchester! Can it be supposed that the Christian public will suffer this state of things to exist without making a strenuous effort at once to meet the exigency of the case? Surely heathens at home should not be neglected.'

Schools and Scientific Institutions.— The education hitherto afforded to the working classes in Manchester has been very defective both in extent and quality. From the 'Report from the Select Committee on the Education of the Poorer Classes,' printed in 1838, much valuable information may be obtained. The Committee decided that daily education ought to be provided for one in eight of the population of a large town, and report that in Manchester only one in thirty-five is receiving an education likely to be useful. The numbers of children of the working classes stated to be at daily schools in the town are—at very indifferent day and dame schools 11,336; other better schools, 5680; total 17,100, on a population estimated at 200,000. The numbers attending Sunday-schools in Manchester are—under the Established Church 10,284, under Dissenters 19,032, Catholics 3812: respecting Sunday-schools the committee remark, 'They consider the instruction there given as of great advantage, by inplanting feelings of religion and giving habits of order, but as imperfect without daily instruction also;' an opinion which will be thought not unfavourable by those who have personal experience of the workings, and therefore of the deficiencies, of these useful makeshifts, especially when they take into account the fact brought to light by Mr. J. Bentley by a personal examination, that in Manchester and Salford 1103 teachers

1,479 scholars come too late to school, and this in the of instruction where, the same authority informs us, ıllowing is on the average all the time employed each ath, that is, each week, namely, in reading about one and fifty minutes; in singing, fourteen minutes and :y-one seconds; in praying, seventeen minutes and '-four seconds: total about two hours and a quarter. :ducational clauses in the last Factory Act have been t small advantage. Dr. Kay stated before the Educa- Committee of 1838, that one cause of failure was that :ans were given in the Act for compelling the erection ›vision of schools; and Mr. Ashworth stated from his :xperience, 'If the manufacturer is desirous to make ıost of the two hours, and give the children education, ay do some service in it, but a compulsory education d upon an employment is a stigma to the employment, s very obnoxious to the employer, and, I think, gene- people laugh at it; it is almost good for nothing.' e Report of Mr. L. Horner on these very clauses , 1839), it is said—'Some parents appreciate the ad- ge (of the education), but most of them would much : their children working full time and earning a full ›f wages.' Under these circumstances it is easy to what good factory education confers. Indeed, Mr. :r reports not more than eight mills in Manchester :'the educational provisions have been best observed,' ı 'best' he allows to be inferior to what primary edu- ı ought to be; and it embraces only 352 boys and ;irls. The school of Messrs. M'Connel he considers y of special notice, and deserving of being held up ample. He adds, 'It is not at all an unusual thing to certificates (of education) presented to us sub- :d by the teacher with his or her *mark*. In the last :r I had a school voucher presented to me with a and when I called on the schoolmaster to read it › me, he could not; I have had to reject the school er of the fireman (to the steam-engine), the children g been schooled in the coal-hole—in one case I actu- ound them there; it occurred at factories where a e capital must be embarked.'

Kay, before the Education Committee, gave in a table ich he calculated that in Manchester there was a total educated and very ill-educated children of 26,265; he actual cost of providing a worthless or indifferent tion by existing methods was 16,021*l.* annually, and ıot more than 19,500*l.* of annual outlay would be re- l for education, by an efficient method, of children now ıcated or very ill educated.

anwhile the diffusion of cheap literature and the ope- ı of institutions for popular instruction are doing some- to educate adults and youths, while the existence of good schools in Manchester for the children of the ng classes will serve as models. In this way the chester Society for Promoting National Education' ›ndered some service. It has at present three schools its superintendence, with about 500 scholars.

ıong the institutions in Manchester having an in- :e on the working classes there may be mentioned the ıæum, the Mechanics' Institution in Cooper Street, the anics' Institution in Miles-Platting, the Ancoats Ly- , the Chorlton Lyceum, and the Parthenon. The ıæum is designed for the benefit chiefly of clerks and upper servants connected with the trade of the town. ·xperiment has been very successful. The number of riptions for the first quarter (1839) is upwards of 900. res on various topics are given by men of eminence. › is a French class, an Italian class, an Amateur Mu- Society, an Essay and Discussion Society; and con- are occasionally given, which are very well attended. :cted with the Institution is a good library, a coffee- and a well-supplied news-room. Its expenditure is 2000*l.* annually; James Heywood, Esq., is the pre- :. The Mechanics' Institution, in Cooper Street, ' the presidentship of Sir B. Heywood, Bart., has con- . great benefits on a class below those to whom reference ›een made. The disbursements of the Institution g 1838 were 2177*l.* The original cost of the building 000*l.*, but as the institution had its resources mainly bed in defraying the annual charges, this sum has been ısed by arrears of interest to 9570*l.*, and, deducting :nds paid, a balance is still due of 8195*l.*, to pay off ı an effort is being made which gives promise of suc- The number of subscribers on the 25th of December last was 1161, of whom 51 were under fourteen years of age, and 446 between fourteen and twenty-one. Sixty-five lectures were delivered during the last year, and were attended by 20,650 males, and 4800 females. Two concerts were also given. There are 5023 volumes in the library; the delivery of books to readers in the last year amounted to 42,451. The number of members in the respective classes were —grammar 128, German language 8, arithmetic 154, elocution and composition 28, mechanical drawing 64, landscape and figure drawing 46, music 24, writing 133, mathematics 18, French 25. Besides these there were the chemistry class, the mutual improvement society, and the natural history class. An exhibition of specimens of machinery, natural history, &c., on a very grand scale, to which 360 persons sent contributions, has been visited by nearly 100,000 persons, at the small charge of sixpence each. There is a reading-room, well furnished with literary and scientific periodicals. It is however to be regretted that the benefits of the establishment do not descend sufficiently low in the social scale, as the following classification of the numbers in 1837 will manifest:—

Principals, engaged as merchants, manufacturers, and mechanists	257
Mechanics, millwrights, and engineers	136
Overlookers, spinners, and other-mill hands	36
Building trades	104
Sundry trades, chiefly handicraft	132
Warehousemen	204
Clerks	150
Artists, architects, engravers, &c.	69
Professional men	7
Schoolmasters	10
Shopkeepers and their assistants	86
No profession	11
Ladies	17
Youths	173
	1392

The knowledge of this fact, combined with a wish to reach the operative classes, has led to the establishment of the Lyceums in Ancoats and in Chorlton-on-Medlock, as well as of the Parthenon; and if we may judge from the first Report of that at Ancoats, which has just been issued, it is reasonable to hope that these institutions will confer immediate benefit on those who are employed in the factories and on other hand-labourers. The subscription is only two shillings a quarter, for which lectures, a library and reading-room, a selection of newspapers, education in classes, and other means of improvement, are provided. The education of females is made a prominent object. The news and reading rooms were opened on the 11th of October, 1838. From the library the average number of deliveries is 120 each evening. There are now on the books 732 members, of whom 246 are below twenty-one years of age; the 715 ordinary members are thus classified:—

Principals, engaged as merchants, manufacturers, and mechanists	10
Professional men	4
Schoolmasters	6
Shopkeepers, master-tradesmen, and their assistants	87
Warehousemen and bookkeepers	132
Mechanics, millwrights, engineers, moulders, and smiths	137
Engravers and pattern-designers	7
Spinners, weavers, and other mill-hands	102
Other trades connected with the manufactures of the town, as dyers, calico-printers, fustian-cutters, &c.	22
Building trades	37
Sundry handicraft trades	85
No profession	7
School-boys	22
Females	57
	715

The Manchester Free Grammar-School was founded by Hugh Oldham, bishop of Exeter. The foundation deed, bearing date 20th August, 1515, states the cause which influenced the founder to be that 'the youth, particularly in the county of Lancaster, had for a long time been in want of instruction, as well on account of the poverty of their parents as for want of some person who should instruct them.' And one of the fundamental requirements is, 'The high-master for the time being shall always appoint one of his scholars to instruct and teach in the one end of the school all infants that shall come there to learn their A B C, primer, and sorts, till they begin grammar.' These quotations show that the school was designed to furnish elementary as well as grammatical learning to the poor and those in need of instruction. The income of this school is now above 5000*l.* a year; and though its operations have been extended under a decree of the court of Chancery, and though the masters receive handsome salaries, the outlay must still leave an annual surplus. The instruction given comprehends the mathematics, the English and French, as well as the Greek and Latin languages; but the school is far from effecting the good which its splendid resources might produce, and cannot be considered as administered in a manner conformable to the donor's intention.

Chetham's Hospital, or *The College*, was founded by charter 1665, Humphrey Chetham being the benefactor, who, having during his life fed and brought up fourteen boys of Manchester and Salford, and of Droylsden, ordered in his will that the number should be augmented by the addition of one from Droylsden, two from Crumpsall, four from Turton, and ten from Bolton, leaving the interest of 7000*l.* for their maintenance and instruction from six to fourteen years of age, at which period they were to be put out to some trade. The scholars are instructed in reading, writing, grammar, and arithmetic. They are clothed, fed, boarded, and lodged. The school is conducted in a convenient old building, which also contains *the College library*, a fine collection of not less than 25,000 volumes, which have been accumulated out of the benefactions of the same H. Chetham: among the books are many rare and most valuable works. The library is open to the use of the public; books are not allowed to be taken out, but a convenient reading-room is provided. At present the good which this library does is but small, the delivery of books to readers not amounting to an average of twenty per day, a circumstance which may be explained by the fact of the library being only open at hours during the day when most persons are engaged.

Among the scientific institutions of the town, the Literary and Philosophical Society stands first in point of time (founded 1781). It has numbered among its members most of the distinguished natives of the vicinity, and many other persons of high reputation: its utility has been fully proved by the publication of its Transactions. The Royal Manchester Institution for the promotion of Literature, Science, and the Arts, formed mainly under the auspices of G. W. Wood, Esq., M.P. for Kendal, has been of service in furthering the diffusion of knowledge: above 30,000*l.* were laid out in the erection of the building. The Manchester Museum, or Natural History Society, which has a handsome hall in Peter Street, ranks among the most useful and interesting institutions of the town, and offers to the public a collection of objects in nature with which few similar establishments can enter into comparison. The council is empowered to open the museum to ladies, strangers, resident non-subscribers, schools, and the working classes.

In its medical schools Manchester has a claim on public esteem, having been the first provincial town to provide a good elementary medical education; and in its numerous and well-conducted medical institutions it possesses very superior advantages. The Infirmary is a school in itself. During the year 1838 its expenditure was 8125*l.* 5*s.* 8*d.*; from June, 1837, to June, 1838, it treated no less than 20,760 patients; and since its foundation, 1752, it has extended its benefits to 629,348 cases. There were in the house and on the books, June 24th, 1838, 1317 invalids. Of the cases treated in 1838, 13,254 were cured; 3584 were cases of accident. Messrs. Jordan and Turner have the honour of having taken the lead in the foundation of the medical schools, the one situated in Marsden Street, the other in Pine Street, in which about 140 pupils are conducted by able professors through a complete course of medical instruction. Manchester has also the advantage of possessing an admirable botanical garden, zoological gardens (recently opened, and affording much promise), a school of design, an architectural society, concert hall, choral society, &c.

Charitable Institutions.—These are too numerous to allow of more than a bare mention of some which are the most useful. The School for the Deaf and Dumb was founded in the year 1825. A new and handsome building for it has just been opened, situated near the botanical gardens, on the Stretford road, a part of which will be appropriated to a blind asylum also, under the will of Mr. Kershaw of Oldham, who bequeathed 20,000*l.* to be applied to the maintenance of an asylum for the blind, so soon as the inhabitants should furnish a suitable building. The Jubilee, or Ladies' Female Charity School, founded in 1806, is conducted in the house in Ducie-road, and educates forty girls for the duties of domestic service. The Manchester and Salford District Provident Society is designed to meet, by a special effort, the special wants of the poor. Following the impulse which Boston (U.S.), under the auspices of Dr. Tuckerman of that city, had given, the society sends forth visitors into all parts of the town (most of them are gratuitous labourers) to visit the poor at their own homes, aid them with advice, encourage them by sympathy, and receive their little savings in order to deposit them in the savings' bank. For this purpose the town is divided into districts and sections, in all 919, of which however 236 only are supplied with visitors. Its mendicity department effects no little good. Three thousand cases were examined by its stipendiary visitors in 1838, whereof 1285 received tickets to the various medical societies, 741 were referred to the relief board of the society, and 942 were found to be cases in which the society could not interfere. Besides these, 413 cases were sent for *inquiry only*, of which number 248 were reported as unworthy, a powerful argument against indiscriminate alms-giving. Work was found for 14 persons, and 98 new cases of gross imposition were detected and exposed. The ministry to the poor, which commenced Jan. 1833, under the patronage of three Unitarian congregations, namely, Cross Street, Mosley Street, and Greengate (Salford), is designed for a similar purpose with the Provident Society. It employs a paid agent, the Rev. G. Buckland, whose duties are not sectarian, but purely benevolent. His visits to the poor average per month about 340, and he has 500 families under his superintendence. Of a similar character is the Town Mission, whose motto is, 'Not to Proselyte, but to Evangelise.' Its expenditure during the last year was 1513*l.*, and the following is the result of the first year's exertions:—'Seventeen thousand eight hundred and thirty-seven hours have been spent by our missionaries in promoting the above objects. They have held eleven hundred and eighty-one meetings. They have paid forty-three thousand three hundred and sixty-seven visits; have lent six hundred and twenty-five Testaments, and distributed in their districts sixty-three thousand one hundred and sixty-two religious tracts. It is estimated that the number of individuals now under their care are at least sixty thousand. The number of visits paid to the sick are four thousand four hundred and eighty-three.' At present it occupies forty-two districts under a superintending missionary and three assistants. These districts contain from five to eight hundred families; about one-fifth of whom reside in cellars, and more than two-thirds of the whole seldom or never think of going to any place of worship. In several of the districts there are not quite twenty families for each house that is licensed for the sale of strong drink; and many of the districts have no place of worship of any kind save those in which the missionaries hold their meetings. It is a fact, well ascertained, that in many districts there are nearly as many reputed brothels as there are houses for the sale of strong drink.

Places of Worship.—The collegiate church is a noble Gothic building. The warden and four fellows have the ecclesiastical patronage of the parish. Their corporate income cannot be accurately stated, as they refused to give answers to a return of the value of their property, ordered by the House of Commons, but the ecclesiastical commissioners report the gross yearly income to be 4650*l.* The new see of Manchester will be in the province of York. [LANCASHIRE, p. 296.] In 1795, Aikin tells us, the number of churches and chapels of the Establishment in Manchester and Salford, actually built or building, amounted to twelve, and about as many places of worship for different sects of dissenters. There are now twenty-five places of worship in connexion with the Establishment, and above sixty in connexion with the dissenters in Manchester and Salford, of which the Wesleyan Methodists have twelve, the Independents eight, the Unitarians five, and the Roman Catholics four. The members of the Establishment in Manchester and Salford amount to 53 per cent. of the whole population. There are three cemeteries in Manchester, each of which has an officiating minister, one in Rusholme Lane, another at Ardwick, and the third at Collyhurst.

Eminent Persons.—Hugh Oldham, bishop of Exeter; John Bradford, put to death by Mary for heresy; Doctor John Dee, the astrologer; John Byrom, author of Byrom's shorthand and of many small poems; Dr. Thomas Percival, an enlightened and benevolent physician; Dr. Henry, and the duke of Bridgewater, though not natives, are too much connected with the town to be passed without notice; and Dr. Dalton still survives to give lustre to a place on which he has conferred signal benefits. Crabtree, a native, ought also to be mentioned. [CRABTREE, WILLIAM.]

(*Communication from Manchester.* For further information see Whitaker's *History of Manchester;* Aikin's *Description of the Country from thirty to forty miles round Manchester;* Wheeler's *History, Antient and Modern, of Manchester; Reports*, &c.)

MANCHINEEL TREE. [HIPPOMANE MANÇANILLA.]

MANCI'PIUM, MANCIPA'TIO. The right apprehension of these terms is of some importance to those who study Roman authors. The following is the description of *Mancipatio* by Gaius (i. 119, &c.):—'Mancipatio is a kind of imaginary sale, and is a peculiar privilege of Roman citizens. It is effected in the following manner:—There must be present not fewer than five witnesses, Roman citizens, of full age, and also another person, of the same class and condition, to hold the brazen scales, who is called *libripens.* The person who receives *in mancipio*, taking hold of the thing, says, "I affirm that this man is my property, according to Quirital Law, and I have purchased him with this money (æs) and these brazen scales." He then strikes the scales with the piece of money, and gives it to him from whom he receives *in mancipio* as the price. In this manner both slaves and free persons are mancipated, as well as animals, which belong to the class of things *mancipii*, or *mancipi*, such as oxen, horses, mules, asses; lands also (prædia), as well in the city as in the country, which are of the class *mancipi*, such as are the Italic lands, are mancipated in the same way. The mancipatio of lands differs from that of other things in this respect only, that persons, whether free or slaves, cannot be mancipated unless they are present, it being necessary that he who receives *in mancipio* should take hold of that which is given him *in mancipio:* whence in fact comes the term *mancipatio*, signifying that the thing is taken (capitur) by the hand (manu); but it is the practice to mancipate lands which are at a distance.'

In this passage Gaius describes generally what 'mancipatio' is, and, by implication, what things admit of 'mancipatio,' or, in other words, what things are 'mancipi.' He was led to these remarks by that part of the subject-matter of his text which treats of the rights of persons, or *status;* and he prefaces his description of 'mancipatio' by stating that all children who are in the power of their parents, and the wife who is in that peculiar relation to her husband when she is said *in manu viri esse* [MARRIAGE], are things *mancipi*, and may be mancipated in the same way as slaves. [EMANCIPATION.]

All things, as subjects of ownership, were either 'res mancipi' or 'res nec mancipi:' and there is, observes Gaius (ii. 18, &c.), 'a great difference between things "mancipi" and things "nec mancipi." The latter can be alienated by bare tradition or delivery, if they are things corporeal, and therefore susceptible of delivery. Thus the property in a garment, gold, or silver, may be transferred by bare tradition. Lands in the provinces may be transferred in the same way.' Thus 'mancipatio' was the proper term for expressing the sale or transfer of things 'mancipi;' and 'traditio' for expressing the transfer of things 'nec mancipi.' (Ulpian, *Frag.*, tit. 19.)

It appears then that the ownership of property generally which belonged to that class of things called 'res mancipi' could only be transferred by the formalities already described: but that the ownership of things which were 'res nec mancipi,' and among them, lands in the provinces, could be transferred without the formalities required in the case of 'res mancipi.' The foundation of the distinction as to lands appears to be this. The real ownership (dominium) of provincial lands was either in the Roman people, in which case the lands were called Stipendiaria; or in the reigning Cæsar, in which case they were called Tributaria. There was therefore no ownership, properly so called, of lands in the provinces by individuals; at least no ownership in the sense in which lands in Italy were held. Lands in Italy held by individuals in full or Quiritarian ownership could be the subjects of usucapion, in jure cessio, mancipatio, and vindicatio: lands in the provinces could not, unless they acquired the Jus Italicum. Originally all the conquered lands even in Italy were Ager Publicus, the property of the state, and so long as they remained in that condition, nothing beyond the use (usus fructus) and occupation of them [POSSESSION] could be in private individuals. Much of the Ager Publicus in course of time was assigned to citizens in full ownership, and accordingly it would become 'mancipi' and subject to the same rule as to alienation as other lands held in Quiritarian ownership.

Mancipatio could only take place between Roman citizens and Latini Colonarii and Latini Juniani, and those Peregrini who enjoyed the Commercium, or privilege of buying and selling. As the effect of Mancipatio was to transfer Quiritarian ownership with its accessory rights of usucapion, in jure cessio, mancipatio, and vindicatio, the reason of the rule is obvious. The form of mancipatio was in some respects a disadvantage, inasmuch as without observing the formalities required by the law, the *legal* property in a thing 'mancipi' could not pass. The mancipatio was that form of transfer of which we find similar examples in the early history of most countries, and implied originally an actual seisin of the thing transferred. No writing being required, it was necessary that there should be some evidence of the transfer, and such evidence was secured by the mode of transfer which the law required. So far as relates to land, mancipatio in its origin may be presumed to have been equivalent to the feoffment with livery of seisin. [FEOFFMENT.]

There was another mode of alienating things 'mancipi,' by the form called *in jure cessio*, which, according to Ulpian, was applicable also to things 'nec mancipi.' The *in jure cessio* was a fictitious action before a competent magistrate at Rome, or a prætor, or before a praeses in a province. The purchaser claimed the thing as his, and the seller either acknowledged his claim or made no defence, upon which the magistrate gave judgment for the purchaser. This form was in effect and was called 'legis actio.' (Gaius, ii. 24.) Its great resemblance to the fictitious suit formerly in use in our own system, called a Fine, might lead to the conjecture that the notion of a Fine was taken by the early practitioners in our courts from the Roman Law; and that this hypothesis is exceedingly probable will be the more apparent, the further any person examines into the connection between the early English and the Roman Law. The *in jure cessio* has apparently a closer resemblance to a Fine than the *transactio* of the Roman Law, to which some writers would refer as the origin of the Fine.

Mancipatio, as Gaius observes (ii. 26), was more in use than the *in jure cessio*, inasmuch as it was easier to transact the business with the assistance of a few friends than to go before a praetor, or a praeses.

Easements (*jura prædiorum*, otherwise called *servitutes*) could be transferred in the case of lands in the city only by the *cessio in jure;* but in the case of lands in the country, also by *mancipatio*. But this observation applies only to Italic lands; in the provinces, rights of this kind, such as right of road, of conveying water, &c., were matter of contract.

Some difficulty has arisen from the use of the word *nexum*, or *nexus*, in connection with *mancipium*. 'Nexum' properly signifies that which is bound or obligated, and hence it may signify the engagement or contract. Thus in the laws of the Twelve Tables, in the words, 'quum nexum faciet mancipiumque,' 'nexum' may signify the contract. Cicero (*Topica*, 5) defines 'Abalienatio' to be 'ejus rei quæ mancipi est, aut traditio alteri nexu, aut in jure cessio, inter quos ea jure civili fieri possunt;' from which it follows that as there are only two ways of transferring the ownership of things 'mancipi,' and as the *in jure cessio* is here mentioned as one, the *nexus* must represent the other, that is, the *mancipatio*. The 'nexus' then in this case must be equivalent to the 'mancipatio,' or, as a more general term, must contain the mancipatio; for the mancipatio does not contain the nexum. This would be consistent with Varro (*De Ling. Lat.*, 5) quoting Manilius, who says that everything is 'nexum' which is transacted by the piece of money and scales (per æs et libram), which includes mancipium: but he adds that M. Scævola considered 'nexum' to be everything transacted per æs et libram, so as to be thereby bound, *except* things which were transferred by mancipatio. Thus the definition of Scævola would exclude 'mancipatio' from the 'nexum,' but would include a testamentary disposition, inasmuch as that also was made per æs et libram (Gaius, ii. 103), and it would also include that form of marriage called *coemptio*. But if Scævola is right, and this can hardly be doubted, Cicero is wrong in the use of 'nexum,' in the passage quoted. In the 'Orator' (i. 39) he mentions both 'nexa' and 'mancipia' in his enumeration of the various subjects brought before the Centumviri. Assuming Scævola's definition to be correct, Cicero may have properly distinguished 'nexum' from 'mancipium' in the passage in the 'Orator;' and have used *nexu* with some inaccuracy in the passage from the 'Topica.'

MANCO CAPAC. [Peru.]

MANDAL. [Christiansand.]

MANDA'MUS is a writ by which the court of king's bench, in the name of the reigning king or queen, commands the party to whom it is addressed to do some act in the performance of which the prosecutor, or person who applies for or sues out the writ, has a legal interest; that is, not merely such an interest as would be recognised in a court of equity or in a court of ecclesiastical jurisdiction, but an interest cognizable in a court of common law; the right must also be one for the enforcing of which the prosecutor has no other specific legal remedy. Thus, a copyholder can transfer or alien his customary tenement or estate [Copyhold] in no other manner than by surrendering it into the hands of the lord of the manor to the use of the purchaser or surrenderee. The courts of common law formerly took no notice of the right of the surrenderee to call upon the lord for a grant or admittance, and the court of king's bench therefore left the party to seek his remedy in a court of equity, and would not interfere by granting a mandamus. But the obligation on the part of the lord to admit the surrenderee is not merely an equitable liability, because this mode of transferring property of this nature is founded upon antient custom, and rights dependent upon custom are matters of common-law cognizance. Of late years the court of king's bench appears to have taken this view of the subject, and has awarded writs of mandamus in all cases where the lord has refused to admit the party to whose use a surrender of the copyhold has been made. Again, the duty of parishioners to assemble in vestry for parochial objects, whether those objects be of a temporal or spiritual nature, is a common-law duty, and a mandamus will be granted to compel the parishioners to meet. But when they are met, the power of the court to interfere further by mandamus depends upon the nature of the act which the parishioners have to do. If the provisions of a statute are to be carried into execution, the act to be done, whatever its nature, is considered a temporal matter, because the construction of statutes belongs preeminently to the courts of common law. But if the object for which the vestry are assembled be one purely of ecclesiastical cognizance, as the setting up of bells, the purchase of books or vestments necessary for divine service, or the making provision for the repairs of the fabric of the church (delinquencies in which matters are punishable by interdict [Interdict] and ecclesiastical censures), the court of king's bench, being without judicial knowledge on such subjects, has no jurisdiction. It is probable indeed that ecclesiastical censures would formerly have been pronounced with less severity against the original delinquents than against those who should have attempted to bring such cases before a lay tribunal. Again, the court can by mandamus compel the visitor of an eleemosynary foundation to hear an appeal, but it has no further authority than 'to put the visitorial power in motion.' It cannot compel him to do any specific act as visitor.

The term 'mandamus' (we command) is found in a great variety of writs, and those usually distinguished by this name by the old law writers are totally different from the modern writ of mandamus, which appears to be nothing more than the antient 'writ of restitution' enlarged to embrace a great variety of objects, that writ being adapted merely to the purpose of restoring a party to an office from which he has been unjustly removed.

The writ of mandamus is now granted not only to restore a man to an office from which he has been wrongfully amoved, but also to admit to an office to which the party has been duly elected or appointed. It lies for a mayor, recorder, alderman, town-councillor, common-councilman, burgess, and town-clerk,—for a prebendary, master of a free-school, parish-clerk, sexton, and scavenger,—to hold a court-baron, court-leet, or a borough court of record,—to justices, to do an act within the scope of their authority, and which will not subject them to an action,—to restore a graduate in a university to degrees from which he has been suspended,—to a corporation, to pay poors-rates where they have not sufficient destrainable property,—to parish officers, to receive a deserted infant,—to permit inspection of documents of a public nature in which the party is interested,—to appoint overseers of the poor,—to swear in churchwardens,—to proceed to the election of a corporate officer,—to grant probate or letters of administration,—to affix the common seal to an answer agreed to by the majority of the members of a corporation aggregate,—and to allow a poor-rate, in which case the rule for a mandamus is absolute in the first instance.

The mandamus is said to be a prerogative writ; by which is meant,—either that the power to award it is not delegated by the crown to the ordinary judges between party and party, that is, the justices of the common pleas, but is reserved for that court in which the king is supposed to be personally present,—or that it is a writ of grace and favour, granted according to discretion, and not a writ of right, that is, not such a writ as the party applying for it has a right to call upon the court to issue under the clause of Magna Charta, by which the king binds himself not to refuse or delay justice or right.

In order to obtain a mandamus the applicant lays before the court the affidavit of himself or of others presenting the facts upon which his right and interest in the thing to be done, and his claim or title to the remedy, are founded. Upon this application the court, if it see a probable cause for interference, grants a rule calling upon the party against whom the writ is prayed, to show cause why such writ should not be awarded. At the appointed time the party so called upon either does not appear, in which case the rule is made absolute, and the mandamus is awarded as prayed, or he appears and resists the rule, either by insisting upon the insufficiency of the facts disclosed by the affidavits upon which the rule was obtained, or by producing other affidavits which give a different aspect to the transaction. If the resistance be effectual the rule is discharged; if not, the mandamus is awarded.

The writ, in the first instance, issues in an alternative form, requiring the party to do the act, or to show why he has not done it. The party may therefore make a return to the writ, saying that he has not done the act required for such and such reasons. Where the reasons returned are insufficient in law, the court quashes the return, and awards a peremptory mandamus requiring the party absolutely, and without allowing him any alternative, to do the act. Where the answer is apparently sufficient, the mandamus is at an end; and if the statements are untrue, the remedy is by action on the case for a false return, though in order to avoid expense and delay the party is allowed in some cases, by the statute 9 Anne, c. 20, and now in all cases, by 1 Will. IV., c. 21, to engraft an action upon the mandamus itself by traversing the return, *i.e.* by putting in a plea contradicting the allegations contained in such return. (Comyns's *Digest*; Selwyn's *Nisi Prius*; 1 Vict., c. 78)

MANDARIN DUCK. [Duck, vol. ix., p. 185.]

MANDARINS is the general name of the officers of state in China. They are chosen from the men of letters or scholars from every part of the empire, who, having obtained their degrees and passed their examination, have their names inscribed in a register kept by a court or board established for this purpose. When an office in the administration is vacant, the court presents to the emperor a list of those who stand foremost on the register, from among whom the monarch appoints one to fill up the vacancy. Sometimes when there are several candidates equally qualified they draw lots for the vacant office. In Duhalde's time there were 13,600 mandarins all over the empire, independent of the military mandarins, or superior officers of the army. The civil mandarins are divided into nine classes, the highest of which, called 'Colaos,' are ministers of state, counsellors of the emperor, or presidents of the supreme courts. The governors of provinces rank in the second class. The secretaries of the emperor belong to the third class; the governors of cities to the fourth class, and so on. Each order has its distinctive mark of dignity; the highest orders wear a peacock's feather at the back of their caps. All is gradation and strict subordination among them.

MANDAVEE. [Cutch, vol. viii., p. 242.]

MANDELSLO. [Olearius.]

MANDEVILLE, SIR JOHN DE, was born at St. Albans, about the year 1300. He was descended from a family of distinction, and appears to have received a better education than was usual in those times. He studied mathematics, theology, and medicine, and for some years pursued the last as a profession. In 1327 he left England, passed through France, and proceeded to Palestine, where he joined the army of the infidels. He afterwards served in Egypt under the sultan, and in Southern China under the khan of Cathay. He resided for three years at the city of Peking, then called Cambalu, and appears to have travelled over a large part of Asia. After an absence of about thirty-three years, he returned to England, and wrote a narrative of his travels, which he dedicated to Edward III. He died on the 17th of November, 1372, at Liège, where he was buried.

His work contained details more ample and minute than any which had previously appeared concerning Palestine, Egypt, and parts of India and China, and must for some centuries have been an extremely interesting work. To render it more amusing, he seems to have borrowed unscrupulously from previous writers; he inserted parts of such chronicles as were then in existence, and introduced romantic tales of knight-errantry, miraculous legends, monsters, giants, and devils. Probably some of the most absurd parts of the work have been added or improved upon by the contemporary copyists.

His reputation as a traveller was very high in his own age. Besides a Latin version of his work, translations of it appeared in all the principal languages of Europe—in Italian, French, Spanish, and German. A MS. of Sir John Mandeville's travels, which belongs to the age of the author, is in the Cottonian Collection in the British Museum (Titus, C. xvi.). The first English edition was printed by Winkyn de Worde, at Westminster, 8vo., 1499: 'A lytell Treatise or Booke, named John Mandevyll, Knyht, born in Englande, in the towne of Saynt Abone, and speaketh of the wayes of the Holy Lande toward Jherusalem, and of Marvyles of Ynde and other dyverse Countries.' The best English edition is that of London, 1725, 8vo.: 'The Voiage and Travaile of Sir John Mandeville,' &c. Perhaps the first printed edition was that of Pietro de Cornero, Milan, 1480, 4to.: 'Tractato delle piu maravigliose Cosse e piu notabili che si trovano in le parte del monde vedute . . del Cavaler Johanne da Mandavilla.'

(*Biog. Univ.*; Watt's *Biblioth. Brit.*; *Manuel du Libraire.*)

MANDEVILLE, BERNARD DE, was born at Dort, in Holland, somewhere about the year 1670. He was brought up to the profession of medicine, and completed his studies and took the degree of Doctor of Medicine in Holland. He afterwards came over to England, to practise his profession in London. He does not appear to have had much success as a physician; but his writings assisted him in procuring the means of subsistence, while they also gained for him considerable notoriety. His first work was 'The Virgin Unmasked, or Female Dialogues betwixt an elderly maiden Lady and her Niece on several diverting Discourses on Love, Marriage, Memoirs, and Morals, &c.,' and was published in 1709. This is a work on a coarse subject, written in a coarse style. In 1714 Mandeville published a short poem, called 'The Grumbling Hive, or Knaves turned Honest,' to which he afterwards added long explanatory notes, and then published the whole under the new title of 'The Fable of the Bees.' This work, which is of an altogether superior character to the 'Virgin Unmasked,' and which, however erroneous may be its views of morals and of society, is written in a proper style, and bears all the marks of an honest and sincere inquiry on an important subject, exposed its author to much obloquy, and, besides meeting with many answers and attacks, was denounced as injurious to morality in a presentment of the Middlesex grand-jury, in 1723. It would appear that some of the hostility against this work, and against Mandeville generally, is to be traced to another publication, recommending the public licensing of stews, the matter and manner of which are certainly exceptionable, though it must at the same time be stated that Mandeville earnestly and with seeming sincerity recommends his plan as a means of diminishing immorality, and that he endeavoured, so far as lay in his power, by affixing a high price and in other ways, to prevent the work from having a general circulation. Mandeville wrote also at this time in a paper called the 'London Journal,' which shared with the 'Fable of the Bees' the censure of the Middlesex grand-jury. He subsequently published a second part of the 'Fable of the Bees,' and several other works, among which are two, entitled 'Free Thoughts on Religion, the Church, and National Happiness,' and 'An Enquiry into the Origin of Honour and the Usefulness of Christianity in War.' We are told by Sir John Hawkins, in his 'Life of Dr. Johnson,' that Mandeville was partly supported by a pension from some Dutch merchants, and that he was much patronised by the first earl of Macclesfield, at whose table he was a a frequent guest. He died on the 21st of January, 1733, in his sixty-third year.

The 'Fable of the Bees, or Private Vices Public Benefits,' may be viewed in two ways, as a satire on men and as a theory of society and national prosperity. So far as it is a satire, it is sufficiently just and pleasant; but viewed in its more ambitious character of a theory of society, it is altogether worthless. It is Mandeville's object to show that national greatness depends on the prevalence of fraud and luxury; and for this purpose he supposes a 'vast hive of bees,' possessing in all respects institutions similar to those of men; he details the various frauds, similar to those among men, practised by bees one upon another in various professions; he shows how the wealth accumulated by means of these frauds is turned, through luxurious habits, to the good of others, who again practise their frauds upon the wealthy; and, having already assumed that wealth cannot be gotten without fraud and cannot exist without luxury, he assumes further that wealth is the only cause and criterion of national greatness. His hive of bees having thus become wealthy and great, he afterwards supposes a mutual jealousy of frauds to arise, and fraud to be by common consent dismissed; and he again assumes that wealth and luxury immediately disappear, and that the greatness of the society is gone. It is needless to point out inconsistencies and errors, such for instance as the absence of all distinction between luxury and vice, when the whole theory rests upon obviously false assumption; and the long dissertations appended to the fable, however amusing and full of valuable remarks, contain no attempts to establish by proof the fundamental points of the theory.

In an 'Enquiry into the Origin of Moral Distinctions,' contained in the 'Fable of the Bees,' Mandeville contends that virtue and vice, and the feelings of moral approbation and disapprobation, have been created in men by their several governments, for the purpose of maintaining society and preserving their own power. Incredible as it seems that such a proposition as this should be seriously put forth, it is yet more so that it should come from one whose object always was, however strange the way in which he set about it, to promote good morals; for there is nothing in Mandeville's writings to warrant the belief that he sought to encourage vice.

MANDINGOES, a negro nation inhabiting the country on the banks of the rivers Senegal and Gambia, and that which extends farther eastward along the upper course of the Joliba or Quorra. This country occupies the northern declivity of the mountain-region which extends between the Gulf of Guinea and the great desert of the Sahara, and which goes under the name of Kong. [Kong.] The Mandingoes constitute a considerable portion of the population of most of the small kingdoms which occupy that extensive tract: in some of them they form a great majority; in others they live mingled with the Foolahs, Yaloffs, Saravulli, Yariba, and others. Their language seems to be more widely spread than any other that is spoken in that part of Africa, as Mungo Park, on his return from the interior, first heard the Mandingo language spoken to the west of Taffara and Iabbi on the Joliba, and found that it was understood as far west as Pisania on the Gambia, and even to Ianjan-Bure or MacCarthy's Island (13° 33′ N. lat. and 14° 45′ W. long.).

The Mandingoes are distinguished among the negro tribes by their stature and some other characteristic features. They are generally above the middle size, well shaped, strong, and capable of enduring great labour. Their features are regular, their nose rather prominent, with the nostrils rather flattened; their lips are not so thick as in other negro tribes, but their hair is woolly. Their colour is a good clear black, inclining to yellow Golberry thinks that the Mandingoes and the Foolahs, in the features of their face, more resemble the Hindus, or blacks of India, than the other negro tribes of Africa.

The Mandingoes in their writing use the Arabic characters, and are Mohammedans; but Golberry thinks that they have retained many of the usages of fetichism as practised on the coast of Guinea by the negroes. As their language is so widely spread over the western countries of Africa, Mr. R. Maxwell Macbrair, who is agent of the Wesleyan Missionary Society, has done good service in lately publishing a grammar and vocabulary of this tongue. The Gospel of St. Matthew has also been recently printed in Mandingo by the British and Foreign Bible Society from a translation by Mr. Macbrair.

The Mandingoes generally live on the produce of small spots of ground which they cultivate, and by the chace; but a considerable number apply themselves to commerce, and evince great shrewdness and activity in trade. Their habitations are mere hovels, but they make good coarse cloth of cotton, and dye it with indigo, a plant which is indigenous in their country: they have also attained some skill in tanning leather, and in smelting and working iron.

(Mungo Park's *Travels in the Interior of Africa*; Golberry's *Travels in Africa*; Washington's *Account of a Mandingo of Nydni-Maru*, in *Lond. Geogr. Jour.*, vol. viii.)

MANDOLINE, a musical instrument of the lute kind, but smaller, having four strings, which are tuned as those of the violin. The mandoline is still met with occasionally in Italy, but has fallen into disuse in most other parts of Europe.

MANDORE, a musical instrument of four strings, of the lute kind, no longer in use under such name.

MANDRAKE. [ATROPA.]

MANDRILL. [BABOON, vol. iii., p. 231.]

MANDSHOO, a nation of Asia who originally inhabited the mountainous country which extends along the northern boundary-line of Corea as far north as the river Songari, an affluent of the Amur. The Mandshoo belong to a widely-spread race, which is generally known under the name of Tungooses. This race is found to the east of a line drawn from the most north-western angle of Corea to the Yalo Pass of the Khing-kan range (49° N., lat.), and thence through Nertskink to the northern extremity of the lake of Baikal, terminating on the shores of the Arctic Sea at the Bay of Katanga. From this line they spread eastward to a line drawn from Okhotzk to the mouth of the the river Lena. This race differs considerably from the Mongols, who inhabit the country farther west, in the form of their body, being tall and of a slender make. The languages of all the tribes of this race have a great similarity in words and construction; and it appears that there is a relationship between them and the language of the Mongols and Turks, as well as some languages of Eastern Europe, especially that of the Finlanders.

The Mandshoo, the most southern of the Tungoose tribes, have risen into great importance during the last two centuries by the conquest of China, and by seating their royal family on the imperial throne of Peking. They began their incursions into the northern provinces of the Celestial Empire about 1610. Their progress at first was slow, but it afterwards became so rapid, that in 1662 they proclaimed the son of their valiant chief Taytsong emperor of China, under the name of Kanghi, and he completed the conquest of the empire with singular success His family still occupies the throne of China. As the Mandshoo are a comparatively small tribe, and have to govern and to keep in subjection the immense population of China, the court of Peking has shown great political sagacity in adopting every means for incorporating the other Tungoose tribes into their own. All individuals belonging to these tribes are in China considered as native Mandshoos, and admitted to the privileges of the conquering nation. A great number of Tungoose families established in Siberia, on the eastern shores of the lake of Baikal, have accordingly abandoned that country, and emigrated to Mandshooria and China, where they serve as soldiers and attain military honours. The civil employments are reserved for the native Chinese, as they alone are acquainted with the manners, institutions, and laws of the country.

(Du Halde's *History of China*; Klaproth's *Asia Polyglotta*; Ritter's *Erdkunde von Asien*, vol. ii.)

MANDSHOORIA now constitutes a government of the Chinese empire under the name of Kirin-oola, or Ghirin-oola. It is the most eastern projection of the high lands of Central Asia, and lies between 42° and 58° N. lat., and between 120° and 142° E. long. Its surface is estimated at 650,000 or 750,000 square miles, which is more than triple the area of France. On the north it borders on Siberia, from which it is separated by a mountain-range, the Yablonoi Khrebet of the Russians, or the Khing-khan Tugwick of the Chinese. On the west it is divided from the Russian province of Da-uria by the river Kerlon, an affluent of the Amur, and from Mongolia by the river Khailar and the mountain-range called Khing-khan-oola. On the south it joins the Chinese provinces of Pe-cheli and Leao-tong, the latter of which formerly belonged to Mandshooria, and has only been detached from it since the present imperial dynasty ascended the throne of Peking. On the east is Corea, from which it is divided by the Tsi-yung-shan and Shan Alin, a high range; and farther north the Sea of Japan and the Gulf of Tartary, which separate the large island of Tarakai from Mandshooria.

A very small portion of the country has been visited by Europeans. The Jesuits who were sent by the emperor to survey the country visited the mountainous tract contiguous to the Tsi-yung-shan as far as Ninguta; and some Russian embassies traversed the country along the eastern declivity of the Khing-khan-oola. The remainder is almost entirely unknown.

Mandshooria may be considered as an immense valley enclosed by high and steep mountains, except at its south-western corner, where a broken and rather hilly tract divides it from the province of Leao-tong. The mountain-chain of the Khing-khan-oola, which forms the western boundary, seems to be the highest. Towards its southern extremity, between 42° and 43° N. lat., is the peak of Pecha, which is thought to rise to more than 15,000 feet. There are other elevated and snow-capped summits farther north. The Yalo Pass, the only one traversed by Europeans, is near 49° N. lat., and even in April is covered with deep snow. The mountain-region of the Yablonoi Khrebet does not attain the snow-line; and its mean elevation probably does not exceed 2500 or 3000 feet above the sea-level. Along the Gulf of Tartary the coast is formed by an exceedingly steep mountain-range, rising to 4000 or 5000 feet, and coming close up to the sea, so that only a few level spots of inconsiderable extent intervene between the range and the water. On the eastern declivity of this range there is a tribe which seems to belong to the same race as the inhabitants of Japan: they are called Ainos or Kechen, and live on the produce of their fishing. This mountain-range seems to allow no passage, as the Ainos have no intercourse with the Mandshoo, who inhabit the country west of the range. At its southern extremity (43° N. lat.) this maritime range is probably connected with the Shan Alin and its continuation the Tsi-yung-shan, which appears to run in a south-south-west direction, until it terminates on the Hoang Hai, or Yellow Sea, in a long promontory, the most southern extremity of which is called the Regent's Sword. The huge mountain-mass of the Shan Alin rises above the snow-line.

The interior of Mandshooria contains, towards its southern extremity, an extensive and nearly level plain, called Cortchin. It lies on both sides of the Siren-Muren, or Leao-Ho, and seems to stretch northward to the banks of the rivers Nonni-oola and Songari. It greatly resembles the desert of the Gobi, which is only separated from it by the Khing-khan range, being mostly covered with sand, and having no water, or only salt lakes; but the grassy spots are more common and more extensive here than in the Gobi, and afford better pasture to the numerous cattle of the Mongols, who occupy this part of Mandshooria, which is also called the Eastern Gobi. In some parts the surface is covered with salt incrustations. The remainder of Mandshooria is supposed to consist of a succession of valleys and mountain-ranges of various elevation. The mountains however are not bare, but covered with forests nearly to the top. The valleys are said to be fertile, and wide along the principal rivers south of the Amur river, and so far it appears that agriculture extends. But that large part of the country which extends from the last-mentioned river to the Yablonoi Khrebet is too cold for agriculture, and its inhabitants live on the produce of their herds and of the chase.

Though the climate of Mandshooria is not equal in severity to that of the Gobi, it must be very cold, as we may infer from its geographical position and its elevation.

The principal river is the Amur, which has numerous tributaries. [Amur.] Through the southern districts runs the Sira-Muren or Leao-Ho, which flows about 500 miles; it rises in the Khing-khan range north of the Peak of Pecha, and runs for nearly 400 miles east, and the remainder of its course south-west, until it falls into the Gulf of Leao-tong. It seems to be navigated nearly up to the place where it turns to the south-west.

Agriculture is common south of the river Amur. Wheat, rye, barley, and buckwheat are cultivated extensively, as well as hemp and cotton. The forests, which cover the greatest part of the surface, are partly composed of oak and lime-trees, and partly of different kinds of pines, fir, and birch. On the mountains towards Corea the rhubarb and the ginseng grow in abundance; both are collected by the natives, and constitute, with corn, the principal articles of export. All domestic animals common to the countries of central Europe are kept in considerable numbers; there are also reindeer in the districts north of the Amur, and camels in many places south of it. Wild animals are numerous, especially those that yield furs, in the forests which clothe the eastern declivity of the Khing-khan, where sables, ermines, bears, wolves, and foxes are found. Among the wild animals peculiar to this and the neighbouring countries are the argali and the dshiggetai. Fish abound in the rivers, especially the sturgeon and salmon. Pearls are said to be found in some of the streams. The mineral riches of Mandshooria are not known.

The population is very vaguely estimated at two millions, but it is probably much underrated. All the people, with the exception of the Mongols, who inhabit Cortchin, belong to the race of the Tungooses. [Mandshoo.] The most widely spread tribe is the Proper Tungooses, who seem to occupy the whole or nearly the whole country north of the Amur, and also the greatest part of that between the Nonni-oola and Songari rivers. They lead in general a nomadic life, subsisting on their herds of cattle or reindeer. The Taguri or Da-ures live on the river Nonni, and are agriculturists. Among them are settled the Yakutes, about 6000 families, which emigrated in 1787 from Siberia. The Mandshoo occupy the south-eastern part of the country: though not the most numerous of the tribes, they are the most important, their sovereign family having ascended the throne of China. [Mandshoo.] They are agriculturists, but pass a great part of their life in hunting. Many Chinese families have settled among them, and have improved their modes of cultivation.

The governor of the province resides at Ghirin-oola, a place of some importance. Ninguta, on the Hurka Pira, an affluent of the Songari river, is the antient residence of the chiefs of the Mandshoo, and is held in great veneration by the court of Peking and the whole nation. Other towns of some importance are Naun-koten, on the Nonni, and Sakhalien, on the Amur.

(Du Halde's *History of China;* Broughton's *Voyage of Discovery in the Northern Portion of the Pacific Ocean;* La Pérouse's *Voyage round the World;* Ritter's *Erdkunde von Asien*, vol. i.)

MANES, the name given by the Romans to souls separated from the body. According to Apuleius (*De Deo Socrat.*) they were originally called lemures, and were divided into two kinds, lares and larvæ; the former being the souls of such persons as had lived virtuous lives, and the latter of such as had been wicked; but that afterwards the name of manes was applied to both. Augustine (*De Civ. Dei*, ix. 11) gives a somewhat different account: he says that the souls of good men became lares, those of evil men lemures or larvæ, and those respecting whom it was uncertain whether their virtues or vices most predominated, manes. According to these accounts, and to a passage in Virgil (*Æn.*, ix. 258-9), the lares were considered by the Romans as the manes of their ancestors.

The etymology of manes is uncertain; it is generally derived, by antient grammarians, from an old word, *manus*, signifying 'good,' probably in the same sense as the Furies were called Eumenides by the Greeks. Some considered the manes as the good and bad genii which accompanied a man through his life; but this notion appears to have been introduced by the later Platonists.

The stones in the Roman burial-places and their funeral urns were generally inscribed with the letters D. M. S., that is, *Dis Manibus Sacrum*, 'Sacred to the Manes Gods.' There are many specimens of such funeral inscriptions in the Townley Gallery, British Museum. The term 'gods,' applied to the manes, would appear to imply a kind of deification of departed souls. If such is the fact, it would be a curious matter of inquiry to ascertain when the manes were first honoured with the title of 'dei' or 'gods.' The things which were left or belonged to the Dii Manes were Religiosae; those consecrated to the Dii Superi were called Sacrae. (Gaius, ii. 4.)

It was the duty of the Pontifex Maximus to see that the manes were propitiated by proper ceremonies (Liv., i. 20); and with this object it was usual to pour libations of wine on the funeral piles, and also sometimes to slaughter animals, especially such as the deceased had been fond of. (Plin., *Ep.*, iv. 2.)

MA'NETHO (Μάνεθως, Μανετῶ, Μαναίθων, or Μανεθῶν), a celebrated Egyptian writer, a native of Diospolis, who is said to have lived in the time of Ptolemy Philadelphus at Mende or Heliopolis, and to have been a man of great learning and wisdom. (Ælian, *De Animal.*, x. 16.) He belonged to the priest caste, and was himself a priest, and interpreter or recorder of religious usages and of the religious and probably also historical writings (ἱερογραμματεύς). It appears probable however that there were more than one individual of this name; and it is therefore doubtful whether all the works which were attributed by antient writers to Manetho were in reality written by the Manetho who lived in the reign of Ptolemy Philadelphus.

The only work of Manetho which has come down to us complete is a poem, in six books, in hexameter verse, on the influence of the stars (ἀποτελεσματικά), which was first published by Gronovius, Leyden, 1698, and has also been edited by Axtius and Rigler, Cologne, 1832. It is probable however, for many reasons, as Heyne has shown in his 'Opuscula Academica' (vol. i., p. 95), that parts at least of this poem could not have been written till a much later date. We also possess considerable fragments of a work of Manetho on the history of the antient kings of Egypt, which there is every reason for supposing was written by the Manetho who lived under Ptolemy Philadelphus. It was in three books or parts, and comprised the period from the earliest times to the death of the last Persian Darius. Considerable fragments are preserved in the treatise of Josephus against Apion; and still greater portions in the 'Chronicles' of George Syncellus, a monk of the ninth century. The 'Chronicles' of Syncellus were principally compiled from the 'Chronicles' of Julius Africanus and Eusebius, bishop of Cæsarea, both of whom made great use of Manetho's 'History.' The work of Africanus is lost, and we only possess a Latin version of that of Eusebius, which was translated out of the Armenian version of the Greek text preserved at Constantinople. Manetho derived his history of the kings of Egypt, whom he divides into 30 classes, called dynasties, from the sacred records in the temple at Heliopolis.

In addition to these works, Manetho is also said to have written:—1, Ἱερὰ βίβλος on the Egyptian religion; 2, Βίβλος τῆς Σώθεως, the subject of which is doubtful; 3, Περὶ ἀρχαισμοῦ καὶ εὐσεβείας, on the antient rites and ceremonies of the Egyptians; 4, Φυσικῶν ἐπιτομή (Laert. *Proœm.*, s. 10), probably the same work as that called by Suidas φυσιολογικά.

It is no easy matter to ascertain the real value of Manetho's 'History' in the form in which it has come down to us. The reader may judge of the use that has been made of it for Egyptian chronology by referring to Rask's *Alte Aegyptische Zeitrechnung* (Altona, 1830), to the works of Champollion, Wilkinson's *Topography of Thebes*, and the other authorities which will be indicated by a reference to these works.

(Fabricii *Bibliotheca Græca*, ed. Harles, vol. iv., p. 128-139; the *Preface* of Axtius and Rigler; and *Egyptian Antiquities*, in the 'Library of Entertaining Knowledge,' vol. i., p. 26, 27.)

MANETTIA CORDIFO'LIA is a Brazilian twining plant, whose roots possess considerable emetic energy. The bark is administered in Brazil in powder, in doses of ½ to 1½ drachms, and is considered a most valuable remedy in dropsy and dysentery. (Lindley's *Flora Medica*, No. 862, p. 432.)

MANFELOUT. [Egypt.]

MANFRE'DI, natural son of the emperor Frederic II. and of a Lombard lady, was appointed by his father, at his death, A.D. 1250, regent of the kingdom of the two Sicilies, until the arrival of his brother Conrad, the legitimate son and heir of Frederic. Pope Innocent IV. excommunicated Manfred, and declared that the dynasty of Suabia had forfeited the crown of Sicily in consequence of Frederic having revolted against the see of Rome, whose feudatory he was. Upon this, most of the towns of Apulia revolted against the authority of Manfred. Conrad however came with an army from Germany, and soon reduced the rebels, but he died in the midst of his successes, in 1254, leaving an only son in Germany, Corradino, then a child two years old. Manfred became again regent of the kingdom in the name of his nephew, and as such had to carry on the war against the pope and his own revolted subjects, among whom the powerful baronial house of San Severino stood foremost. The city of Naples opened its gates to the pope and swore allegiance to him; but Manfred found refuge among his father's faithful Saracens at Lucera. Upon the death of Innocent, which took place soon after, Manfred recovered possession of Naples, and cleared the kingdom of the invaders. A report being spread that Corradino had died in Germany, the barons, prelates, and towns of the kingdom invited Manfred to ascend the throne, and he was crowned at Palermo in 1258. On his return to Apulia, he found messengers from Margaret, Corradino's mother, who informed him that his nephew was still alive, and they claimed his inheritance in his name. Manfred refused to resign the crown, but declared in the presence of the envoys that as he had no male issue, the crown should at his death devolve on his nephew or his nephew's heirs. No one presumed to gainsay Manfred's words: he was brave, high spirited, and handsome, and the idol of the people. He had just delivered the country from the invaders, and his illegitimate birth was no longer remembered. Margaret herself tacitly assented to his retaining the crown upon such conditions: her son was but a boy, and had a fair prospect of succeeding his uncle in due time. To crown Manfred's good fortune, Pope Alexander IV. made peace with him. Manfred was now looked upon as the hereditary protector of the Guibelines of North Italy, and he sent troops to the assistance of those of Tuscany, who defeated the Guelphs at Monteaperto, and occupied Florence. In 1261 Alexander IV. died, and was succeeded by Urban IV., an inveterate enemy of the Guibelines and of the House of Suabia. The new pope began by excommunicating Manfred, treating him as a usurper, and offering the crown of Sicily for sale among the princes of Europe. He offered it to Richard, earl of Cornwall, brother to Henry III. of England, who laughed at the proposal, and said 'it was like making him a present of the moon.' Urban then offered the crown of Sicily to Henry himself for his second son Edmund, but the English king had neither troops nor money to enforce such a claim. At last the pope addressed himself to Charles, count of Anjou, brother of Louis IX. of France, who accepted the offer in 1264: the conditions were, that he should receive the crown of Sicily as a fief of the see of Rome, pay a yearly fee of a thousand ounces of gold and a white horse, surrender to the pope the right of nominating to all the sees of the kingdom, and grant an appeal to Rome on all ecclesiastical affairs. After concluding this bargain, Urban died, but his successor Clement IV. followed up his policy. Charles, having collected an army of his Provençal vassals and of French adventurers, came to Rome, where he was solemnly crowned by Clement in 1265. In January, 1266, he marched from Rome, and entered the dominions of Manfred, who met him under the walls of Benevento. A desperate battle took place in the month of February. Manfred's faithful Saracens fought bravely, but being unsupported by the Apulian troops, who refused to advance, they were thrown into disorder, and Manfred, seeing himself betrayed, spurred his horse into the thickest of the enemy's ranks, and fell under a heap of the slain. His body was buried by Charles's soldiers, without any honours, under a heap of stones on the banks of the river Calore, but the papal legate ordered it to be disinterred, because, being excommunicated, it could not remain within ground belonging to the holy see. The body was dragged as far as the frontiers of Abruzzo, where it was allowed to rest on the banks of the river Verde, an affluent of the Tronto, near Ascoli. Dante, in pathetic and at the same time indignant strains, alludes to this disgraceful act of fanaticism ('Purgatorio,' canto iii.).

Manfred was fond of letters, was himself a poet, and is praised by the Neapolitan chroniclers for his great and noble qualities. The Guelph writers, on the contrary, have accused him of horrid crimes; among others, of poisoning and incest. This tradition has preserved the remembrance of him as a dark and mysterious character. Manfred was the founder of the town of Manfredonia.

MANFREDO'NIA. [CAPITANATA.]

MANGABEY, a name for two species of monkeys belonging to the group of *Guenons*. [GUENONS.]

MANGALORE. [HINDUSTAN, p. 207.]

MANGANESE, a metal of which the black oxide, or binoxide, was first described by Scheele in 1774, and was afterwards determined by him and Gahn to contain a peculiar metal, which has so powerful an affinity for oxygen, that this circumstance alone would prevent its occurrence in nature in its metallic state. The natural compounds of manganese, and especially its oxides, are numerous, and are found abundantly in many parts of the earth. Like oxide of iron, it frequently occurs in minerals in such small quantity as to show that it exists in them rather in mixture than combination.

Manganese may be procured by mixing any of its oxides with oil, and heating it strongly in a well covered crucible. Its properties are, that it has a greyish-white colour and resembles white cast-iron in appearance; it is hard, brittle, and has a fasciculated crystalline structure; its specific gravity, according to Berthier, is 7·05; it is inodorous and tasteless, but when breathed upon emits a smell of hydrogen gas. By exposure to the air manganese readily tarnishes by oxidizement, and even in a very short time attracts sufficient oxygen to lose its metallic lustre, and falls to a reddish-brown powder; hence the necessity for preserving it immersed in naphtha. Even at common temperatures it slowly decomposes water; and at a red heat the decomposition is rapidly effected, and in both cases hydrogen gas is evolved and oxide of manganese formed. It requires an extremely high temperature for its fusion, and it is fixed in the fire.

The ores of manganese are chiefly oxides: they are the following:—

Haussmannite.—Occurs crystallized in octohedrons and massive. Primary form a square prism. Cleavage parallel to the base of the primary form. Fracture uneven. Hardness rather greater than that of phosphate of lime. Colour brownish-black. Powder reddish-brown. Lustre imperfect metallic. Opaque. Specific gravity 4·722.

Before the blow-pipe with borax fuses into an amethystine-coloured glass. It is found at Ilmenau in Thuringia, at Framont, and in Pennsylvania, &c.

Dr. Turner's analysis gives very nearly—

Manganese . . .	70·98
Oxygen . . .	27·33
Silica	0·34
Barytes . . .	0·11
Water	0·43
	99·19

The equivalent of manganese being 28, this ore is essentially a compound of 3 equivalents of metal 84 + 4 equivalents of oxygen 32 = 116. It contains less oxygen than any other oxide except the protoxide, which does not occur in nature except in combination.

Braunite.—Occurs crystallized and massive. Primary form a square prism. Cleavage distinct, parallel to the faces of an octohedron. Fracture uneven. Hardness 6·0 to 6·5. Brittle. Colour brownish-black. Streak the same. Lustre imperfect metallic. Opaque. Specific gravity 4·818. The massive varieties are divergingly fibrous.

Before the blow-pipe melts and effervesces slightly with borax.

It is found at Elgenberg, Wursindel, Piedmont, and in Cornwall.

According to Dr. Turner, it consists very nearly of—

Manganese . . .	67·76
Oxygen . . .	29·03
Barytes . . .	2·26
Water	0·95
	100·

It is essentially an anhydrous sesquioxide of manganese, consisting of 1 equivalent of metal 28 + 1½ equivalent of oxygen 12 = 40.

Manganite.—Occurs crystallized and massive. Primary form a right rhombic prism. Cleavage parallel to the lateral faces. Fracture uneven. Hardness 4·0 to 4·25. Scratches glass slightly. Colour iron and steel, and blackish-grey. Streak reddish-brown. Lustre metallic. Opaque. Specific gravity 4·328. Massive varieties amorphous. Structure crystalline, granular, large fibrous.

Before the blow-pipe, with borax, fuses into a transparent amethystine glass; heated in a tube, water is expelled. It occurs at Hartshill near Coventry, in Devonshire, Ilfeld in the Harz, &c.

Dr. Turner's analysis gives very nearly—

Manganese . . .	62·93
Oxygen . . .	26·97
Water	10·10
	100·

It is therefore hydrated sesquioxide of manganese.

Varvicite.—Occurs massive and in pseudo-crystals. Composed of thin plates and fibres. Hardness 2·5. Colour grey. Powder black. Lustre metallic. Opaque. Specific gravity 4·531. When strongly heated yields oxygen gas and water.

It occurs massive at Hartshill in the county of Warwick, and the pseudo-crystals at Ilfeld.

Analysis according to Phillips—

Manganese . . .	63·1
Oxygen	31·5
Water	5·4
	100·

It is a compound of 4 equivalents of metal 112 + 7 equivalents of oxygen 56 and 1 equivalent of water 9.

Pyrolusite.—Occurs crystallized and massive. Primary form a right rhombic prism. Cleavage parallel to the lateral planes and short diagonal; indistinct. Fracture uneven. Hardness 2·0 to 2·5. Colour blackish-grey and black. Streak black. Lustre imperfect metallic. Opaque. Specific gravity 4·94.

Massive varieties amorphous, reniform, and botryoidal. Structure granular, fibrous.

It is the most abundant ore of manganese, occurring in large quantity in Devonshire, Warwickshire, Thuringia, Brazil, and many other places.

Dr. Turner's analysis gives very nearly—

Manganese . . .	61·86
Oxygen . . .	35·36
Silica	0·56
Barytes . . .	0·66
Water	1·56
	100·

It is a compound of 1 equivalent of metal 28 + 2 equivalents of oxygen 16 = 44, and is the per- or bin-oxide.

Hydrated Binoxide of Manganese has long been known by the name of *black wad.*—It occurs of various shades of brown, and is massive, botryoidal, amorphous, and sometimes pulverulent. It is frequently soft enough to soil the fingers. It occurs largely in Devonshire, and is also met with in Cornwall, the Harz, Piedmont, and many other places.

Analysis of a specimen from the Harz by Klaproth:—

Peroxide of Manganese .	68
Oxide of Iron . . .	6·5
Water	17·5
Silica and Barytes . .	9·
Carbon	1
	102·

Psilomelane is an ore of manganese which contains a considerable quantity of barytes. It occurs reniform, botryoidal, and stalactitic. Structure granular, compact, and indistinctly fibrous. Fracture conchoidal, even. Hardness 5·0 to 6·0. Colour dark-grey and greyish-black. Streak brownish-black. Lustre imperfect metallic. Opaque. Specific gravity 4·0 to 4·15. It occurs in Devonshire, Cornwall, in the Harz, and most manganese mines.

Dr. Turner's analysis gives—

Red oxide of Manganese	69·795
Oxygen . . .	7·364
Barytes . . .	16·365
Water . . .	6·216
Silica	0·260
	100·

Sulphur is also found in combination with manganese. The compound is called

Kobellite, Manganese Blende, &c.—It occurs crystallized and massive. Primary form a cube. Cleavage parallel to its faces. Fracture uneven, conchoidal. Hardness 3·5 to 4·0. Colour brownish-black; when fresh fractured, steel-grey. Streak dark-green. Lustre imperfect metallic. Opaque. Specific gravity 4·014.

Fuses with difficulty and only the edges with the blow-pipe; gives sulphuretted hydrogen when dissolved in an acid.

It is found at Nagyag in Transylvania, and in Mexico.

Analysis by Arfwedson—

Manganese . . .	62·
Sulphur . . .	37·6
	99·6

Manganese occurs also in combination with some metals and oxides.

Arseniuret of Manganese.—Occurs massive. Fracture in one direction granular and shining, in the other dull. Structure foliated. Hard. Brittle. Specific gravity 5·55. Found in Saxony. Colour whitish-grey. Blackens by exposure to the air.

Dr. Kane found it to consist of—

Manganese . . .	45·5
Arsenic with a trace of Iron	51·8
	97·3

Cupreous Manganese.—Occurs massive, reniform, and botryoidal. Structure compact. Fracture imperfect conchoidal. Hardness about 1·5. Colour bluish-black. Streak the same. Lustre resinous. Opaque. Specific gravity about 3·2.

Occurs in Bohemia and Chili.

Analysis by Kersten—

Oxide of manganese .	74·10
Oxide of copper . .	4·80
Water	20·10
Sulphate of lime . .	1·05
Silica	0·30
	100·35

Carbonic acid and silica also occur in combination with oxide of manganese, and the latter also with oxide of manganese and iron.

Carbonate of Manganese: Kohlerite.—Occurs crystallized and massive. Primary form a rhomboid. Cleavage parallel to the primary planes. Fracture uneven, conchoidal. Hardness 3·5. Colour rose-red, brownish. Streak white. Transluscent. Lustre vitreous, pearly. Specific gravity 3·3 to 3·6. Massive varieties globular, botryoidal. Structure compact, fibrous, granular. Colour yellowish-white. Opaque.

Found at Hartshill in Warwickshire, Nagyag, Freyberg, &c.

Analysis of the carbonate from Nagyag by Berthier—

Carbonic acid . . .	38·6
Protoxide of manganese .	56·0
Lime	5·4
	100·

Silicate of Manganese.—Occurs crystallized and massive. Primary form an oblique rhombic prism. Cleavage parallel to the lateral faces of the primary crystal. Fracture uneven and conchoidal. Scratches glass. Colour rose-red. Translucent on the edges. Lustre between pearly and resinous. Specific gravity 3·538 to 3·685.

It occurs in Sweden, the Harz, Devonshire, Cornwall, &c.

Analysis by Berzelius—

Silica	48·
Oxide of manganese .	49·04
Lime and magnesia .	3·34
	100·38

Leonhard has described some silicates of manganese under the names of *allagite, photizite, rhodonite,* &c., which contain admixtures of various other substances.

Silicate of Manganese and Iron: Knebelite.—The locality of this is not known. It occurs massive. Externally cellular and uneven. Fracture imperfect conchoidal. Lustre glistening. Colour grey; spotted dirty-white, red, brown, and green. It is opaque, hard, and brittle. Specific gravity 3·714.

Analysis by Döbereiner—

Silica	32·5
Protoxide of manganese .	35
Protoxide of iron . .	32
	99·5

Phosphate of Manganese and Iron: Ullmannite.—Occurs massive. Fracture conchoidal. Hardness 5·0 to 5·5. Colour reddish-brown, or blackish. Lustre resinous. Opaque. Specific gravity 3·439 to 3·775.

Occurs at Limoges in France.

Analysis by Berzelius—

Phosphoric acid . .	32·8
Oxide of manganese .	32·6
Oxide of iron . . .	31·9
Phosphate of lime . .	3·2
	100·5

Two other varieties have been described under the name of *Heteposite* and *Huraulite.*

Having now noticed the more important manganese ores, we proceed to mention the action of other elementary bodies upon this metal, and first the artificial compounds of—

Oxygen and Manganese.—It has been already mentioned that this metal falls to powder by oxidation, even by exposure to the air, and the oxide thus formed appears to be the red oxide of manganese: the native compound has been already described under the name of haussmannite. The protoxide of manganese exists in nature only in combination, forming the carbonate of manganese, also mentioned.

Protoxide of Manganese may be artificially procured in two or three ways:—1st. When the peroxide of manganese is strongly heated in an iron retort for the purpose of obtaining oxygen gas, green protoxide of manganese will sometimes remain, though it is in general the red oxide which is thus obtained; 2nd. The protoxide may be obtained by passing hydrogen gas over any higher oxide, but the red is to be preferred as containing the least oxygen; 3rd, by mixing chloride of manganese with twice its weight of carbonate of soda, and heating the mixture in a platina crucible, and afterwards dissolving out the chloride of sodium formed with water.

The properties of protoxide of manganese are:—It is of a light green colour. It undergoes no change by exposure to the air. It is insoluble in water. When heated to 600° it acquires oxygen, and is converted into red oxide; and sometimes, by exposure to a strong heat, it undergoes combustion as well as oxidation. It combines readily with acids, and dissolves in them, even when dilute and cold, without effervescence; and the solutions are colourless. It is this oxide which is the base of all the common salts of manganese; indeed it is questionable whether any other oxide acts as a base. When this oxide is precipitated from solution by an alkali, it forms a white hydrate, which speedily loses water and acquires oxygen by exposure to the air, and becomes deutoxide. It is composed of—

One equivalent of oxygen . .	8
One " manganese . .	28
Equivalent	36

Red Oxide of Manganese: Haussmannite, already described.—It is artificially obtained by submitting either the protoxide, sesquioxide, or peroxide of manganese to heat in a platina crucible; the first acquires and the two last lose oxygen by this process; in fact, whatever oxide or salt of manganese is strongly heated, it is decomposed and converted into this, and remains permanently such unless some additional deoxidizing agent be employed. It suffers no change by exposure to the air, is insoluble in water, and has a reddish colour. The nitric, sulphuric, and hydrochloric acids all decompose it, the two first separating it into protoxide and binoxide; and they dissolve the first and leave the second insoluble. With hydrochloric acid it yields a chloride and chlorine.

It is composed of—

Four equivalents of oxygen . .	32 or	10·66,	1⅓ eq.
Three equivalents of manganese	84	28	1 eq.
Equivalent	116	38·66	

Sesquioxide, Deutoxide of Manganese.—The native has been described under the name of manganite. It may be artificially procured in the mode just alluded to, by decomposing a protosalt with an alkali, and exposing the precipitate to the air, or by cautiously heating the peroxide or carbonate of manganese: in the former case oxygen is expelled, and in the latter carbonic acid is expelled and oxygen absorbed; it may further be obtained by decomposing the nitrate with heat. Its properties are:—It is brown, except when obtained from the nitrate, and then it is nearly black. It is insoluble in water, suffers no change by exposure to the air, is decomposed by dilute nitric and sulphuric acids, being separated by them into protoxide, which they dissolve, and peroxide, which remains insoluble. It is said to be soluble in strong sulphuric acid without decomposition; with hydrochloric acid it yields chlorine and chloride of manganese.

It is composed of—

One and a half equivalent of oxygen .	12
One equivalent of manganese . .	28
Equivalent	40

Varvicite.—This has not been obtained by artificial means.

Binoxide or Peroxide of Manganese: Pyrolusite.—This may be formed artificially by decomposing either the red oxide, sesquioxide, or varvicite by means of dilute sulphuric acid, they being all separated into protoxide, which dissolves, and binoxide, which remains insoluble. It may also be prepared by adding chloride of lime to a solution of chloride of manganese, in which case it is thrown down in the state of a black powder.

Its properties are:—It is black, or brownish-black, unalterable in the air, insoluble in water, decomposed by heat into red oxide and oxygen gas, insoluble in alkalis, unacted upon by nitric acid or dilute sulphuric; but by the last acid, when concentrated, resolved into protoxide and oxygen gas; and is thus sometimes used for preparing the protosulphate and oxygen. With hydrochloric acid it gives protochloride and chlorine.

It is composed of—

Two equivalents of oxygen . .	16
One equivalent of manganese . .	28
Equivalent	44

Of the five oxides of manganese it will appear that three are resolvable, by the action of dilute sulphuric acid, into definite compounds of the protoxide and binoxide, thus:—

		Oxygen.		Metal.		Protoxide.		Binoxide.
One equiv. of sesquioxide	=	3	+	2	=	1	+	1
" " red oxide	=	4	+	3	=	2	+	1
" " varvicite	=	7	+	4	=	1	+	3

And in point of fact some chemists consider them to be rather compounds of other oxides than as constituting peculiar oxides. There are two acids of manganese which are entirely artificial compounds, namely, the manganic acid and per-, or, more properly, the hyper-manganic acid.

Manganic Acid has not hitherto been obtained in a separate state; but manganate of potash is easily prepared by heating in a silver crucible one part of powdered binoxide of manganese and two parts of potash. When the mixture has been kept at a dull red heat for an hour, it may be poured out, and when cold put into a bottle and excluded from the air.

The manganate of potash thus obtained is of a green colour. During the operation of the heat one portion of the binoxide yields oxygen to the other, which is by this converted into manganic acid, and this, united with the potash, forms the salt in question, which has long been known by the name of *mineral chameleon,* on account of the change of colour which the solution undorgoes: on the first addition of cold water a green solution is obtained; this soon becomes blue, purple, and red, and ultimately brown; hydrated binoxide of manganese separates, and the solution is rendered colourless. These changes are produced more quickly by employing hot instead of cold water; they are owing to the conversion of the manganate into red hypermanganate of potash, the varied tints being derived from a mixture of these two salts.

By keeping a strong solution of the green manganate of potash to subside, and allowing the clear liquor, when poured off, to evaporate in vacuo over sulphuric acid, the salt is obtained in crystals, which are anhydrous and permanent in their dry state, but must be kept from the contact of organic matter, which speedily deoxidizes the acid.

Manganic acid is composed of—

Three equivalents of oxygen	24
One equivalent of manganese	28
Equivalent	52

Hypermanganic Acid.—This may be prepared by several processes. Mix together four parts of finely-powdered binoxide of manganese, three and a half of chlorate of potash, and five of hydrate dissolved in a small quantity of water. Evaporate the mixture to dryness, and heat it to dull redness in a platina crucible. The mass is to be added to a large quantity of boiling water; and when separated from the residual oxide of manganese, is to be quickly evaporated and allowed to crystallize; the crystals are to be washed with a very little boiling water, and are of a very deep colour.

Hypermanganic acid may be obtained in a separate state by decomposing the barytic salt with dilute sulphuric acid. It has a fine red colour, and is rapidly decomposed by organic matter, as paper or linen. It bleaches coloured matter; the aqueous solution begins to decompose when heated to 86°, and is totally decomposed at 212°; oxygen is given out, and binoxide of manganese is precipitated. Its salts are more permanent than the acid, and when heated they yield oxygen gas, deflagrate when thrown on burning charcoal, and detonate violently with phosphorus. A very minute portion of hypermanganate of potash imparts a very rich purple to a large quantity of water.

Hypermanganic acid is composed of—

Three and a half equivs. of oxygen	32
One equivalent of manganese	28
Equivalent	60

Chlorine and Manganese form two compounds. The *protochloride* may be prepared by dissolving any pure oxide in hydrochloric acid, and evaporating the solution to dryness out of the contact of air. It is a pink-coloured lamellated mass, which attracts moisture readily from the air, and is very soluble in water, forming a solution which is nearly or quite colourless.

It is composed of—

One equivalent of chlorine	36
One equivalent of manganese	28
Equivalent	64

Perchloride of Manganese is prepared by the mutual decomposition of hydrochloric and hypermanganic acids. It is a greenish-coloured vapour, which, by cooling to 4°, condenses into a greenish-brown-coloured fluid. When it comes into contact with moisture it resolves again into hydrochloric and hypermanganic acids.

It is composed of—

Three and a half equivs. of chlorine	126
One equivalent of manganese	28
Equivalent	154

Sulphur and Manganese may be combined by heating a mixture of sulphur and the binoxide. Sulphurous acid gas is evolved, and a greenish powder is left which gives out hydrosulphuric acid when dissolved in acids. It may also be prepared by the addition of a hydrosulphate to a sulphate of manganese. It is then precipitated in combination with water, which modifies the colour.

It is composed of—

One equivalent of sulphur	16
One equivalent of manganese	28
Equivalent	44

According to Berzelius manganese combines with several other metals, as gold, silver, copper, tin, and iron; with the last-mentioned combination takes place readily, and the iron is rendered harder, whiter, and more brittle by it; and it is stated that iron which contains manganese is best adapted for making steel. A small quantity of iron causes manganese to obey the magnet, and renders it less oxidable.

The salts of manganese are compounds of very little importance. As that which is most readily obtained in a pure state, and as offering a type of the soluble salts of this metal, we will mention the

Sulphate of Manganese.—This salt may be obtained by dissolving the protoxide or carbonate in dilute sulphuric acid; a solution is obtained which is nearly colourless, or sometimes of a slight pink colour, owing to the presence of a little hypermanganic acid. By evaporation colourless rhombic crystals are obtained, which have a bitter taste, effloresce in a dry atmosphere, and are soluble in about two and a half times their weight of water.

This salt is decomposed by the alkalis ammonia, potash, and soda, which precipitate colourless hydrated protoxide; and by the carbonates, which throw down white protocarbonate of manganese, and all these precipitates readily acquire oxygen and a brown colour, and are converted into deutoxide. Ferrocyanide of potassium gives a white precipitate, and hydrosulphuret of ammonia an orange one. Manganese is not precipitated in the metallic state by any other metal.

Oxide of manganese tinges glass of an amethystine colour.

The oxides of manganese, and especially the binoxide, as containing most oxygen, are largely employed in the preparation of chlorine [CHLORINE] for the manufacture of bleaching-powder, or chloride of lime. It is employed in glass-making to correct the yellow colour which oxide of iron is apt to impart to the glass; it is used also in making the black enamel of pottery. Sulphate of manganese has also been used within a few years to give a brown colour in calico-printing.

MANGE, an eruptive disease to which many domestic animals, and particularly dogs, are subject. It usually occurs as the result of dirt and confinement, bad or deficient food, or some other circumstances producing a generally unhealthy condition. It has many analogies to the itch in man [ITCH]; and the fluid discharged from the eruption of the mange in horses and dogs has sometimes been known to produce the itch in the human skin. Both appear to depend in general on the presence of a minute species of Acarus which burrows beneath the skin, and thus excites the irritation and itching by which these diseases are peculiarly characterised.

MANGEL WURZEL. [BEET.]

MANGI'FERA, a genus of trees of the natural family of *Terebinthaceæ*, tribe *Anacardiæ*, so called from the Malayan name (*manga*) of the fruit, and *fero*, I bear. Three or four species of this genus are enumerated: as *M. fœtida* of Loureiro, a native of Cochin China and the Moluccas; *M. laxiflora*, indigenous in Mauritius; and *M. sylvatica*, of Roxburgh, a native of the hilly districts bordering on Silhet, where it grows to a great size, and is called *lukshmee-am*. It bears a fruit which ripens in February and March, and is eaten by the natives, though not so palatable as even a bad mango. It is also dried and kept by them for medicinal purposes. *M. oppositifolia*, Roxb., a native of Rangoon, is proposed by Messrs. Wight and Arnott to be formed into a distinct genus.

The Mango tree however, *Mangifera Indica*, is alone of any consequence, and this as forming one of the most grateful fruits of the tropical parts of Asia; it extends also as far north as 30°, and has been successfully introduced into the West Indies. The trees grow to a great size, with an erect trunk, and dark-coloured cracked bark. The wood is of a whitish or a dull grey colour, porous, yet pretty durable if kept dry. The leaves are alternate, petioled, lanceolar, entire, often a little waved at the margins, firm, smooth, shining, and having, when bruised, a pleasant resinous smell. The flowers are yellow-coloured and small, but produced in great numbers, on large terminal erect panicles. Many perfect male flowers are often found intermixed with the hermaphrodite ones. Calyx five-leaved. Petals five, lanceolate, twice the length of the calyx, furnished in the inside with a lobed glandular scale or crust. Stamen a single fertile one, with three or four filament-like bodies, which represent the abortive stamens. Ovary with its base immersed in the torus, obliquely oval, one-celled, with a single ovule attached to the side of the cell. Style one, from the upper edge of the ovary, curved downwards. Drupe oblong, or somewhat kidney-formed, also a little compressed like a kidney, fleshy, with a smooth rind, yellow or reddish when ripe, size various, but in general about as large as a goose's egg. Nut conformable to the drupe, but more compressed, woody, one-celled, two-valved, covered on the outside with many fibrous filaments, particularly in the worst sorts. The kernels are large. Embryo between erect and transverse. Cotyledons thick, fleshy. Radicle opposite to hilum.

The Mango is so well known as one of the most highly esteemed fruits of the East, that one is surprised to find it sometimes described as like nothing so much as a mixture of tow and turpentine. The latter is a secretion abounding in the family to which the Mango belongs, and may be secreted in larger quantities in neglected varieties, where also the filaments of the nut will likewise abound. But in well-cultivated varieties the fruit is sweet and rich-flavoured, juicy, and nearly as free of fibres as a melon. The kernels contain much nourishment, but are never used for food except in famines, when they are cooked in the steam of water, and used as an article of diet.

The tree is generally raised from seeds, which should be sown soon after they are gathered, but this is a very uncertain way of getting the finer varieties. Propagating by layers, and grafting by approach, are the only modes of certainly continuing fine sorts, as well as of improving them. These have the advantages also of bearing when small in size, that is, only a few feet in height, and therefore well suited to culture in the hothouses of Europe. Sweet states 'that the Mango ripens in this country when the plants are of a good size. Sandy loam, or a mixture of loam and peat, is most suitable to it, and the pits should be well drained, as the plants are apt to get sodden with too much water. Fresh seeds from the West Indies vegetate freely. The plant may also be increased from cuttings, which root best in sand under a hand-glass.' It would be advisable also to imitate its native climate as much as possible, that is, after winter, giving it dry heat with watering for some months, and then removing it into an orchideous house in the season of ripening its fruit.

MANGOSTEEN. [Garcinia.]

MANGOUSTES. [Ichneumon.]

MANGROVE. [Rhizophora.]

MANHEIM, or MANNHEIM, the capital of the circle of the Lower Rhine, in the grand-duchy of Baden, is situated in 49° 29′ N. lat. and 8° 28′ E. long., in a very fertile plain, at the junction of the Neckar with the Rhine. Over both rivers there are bridges of boats: that over the Rhine, which belongs to Baden and Bavaria in common, rests on 43 pontoons; that over the Neckar, which rests on 28 pontoons, is 200 paces in length. Manheim is a new city built with great regularity: it consists of broad, straight, parallel streets, of which 11 run in one direction, and are crossed by 11 others at right angles. The houses are handsome, of equal height, all of two stories, except those at the corners, which have three stories. The principal street, 1200 paces long and 60 feet wide, leads from the Neckar Gate to the palace of the grand-duke, which is a very magnificent building, and one of the finest of the kind in Germany; it is feet in length, occupying the whole side next the Rhine, and consists of two great quadrangles. The front next the Rhine is built of a red stone intermixed with a whiter kind, and the general effect resembles that of Hampton Court. In the bombardment by the French in 1795 part of the left wing was destroyed. The right wing contains a gallery of pictures, a cabinet of natural history, a collection of plaster casts of the most celebrated antiques, and a library of 60,000 volumes. There are besides several fine apartments, a large hall called the Rittersaal (Knights' Hall), and a handsome chapel. Among the other public buildings the most worthy of notice are the observatory, the merchants' hall, resting on 72 arches, and 160 paces in length, and adorned with a lofty tower; the new arsenal, which is 92 feet high, 200 paces long, and 118 paces deep; and the splendid church, formerly belonging to the Jesuits, the theatre, the Lutheran, Calvinist, and Catholic churches, three hospitals, &c. Of the ten squares, the handsomest are the Parade, in which there is a marble fountain (but without water), with five statues cast by Crepello, and the great market-place, in which there is a celebrated group called the 'Mercury Group,' by Vandebranden. Manheim has likewise a gymnasium, a botanic garden, a mercantile school, an academy of painting and sculpture, and other establishments for education. The fortifications having been entirely demolished by the French, and the site subsequently converted into gardens, the inhabitants enjoy the benefit of beautiful public promenades, besides the fine park of the palace, which is nearly 200 acres in extent. The situation of Manheim in a fine country and near two large rivers would seem to give it great advantages as a place of trade, and several of its princes have turned their attention to this subject; but the same local circumstances have rendered it an important military station, and exposed it to sieges, bombardments, and the passage of hostile troops. There is however a considerable carrying and transit trade. There are manufactories of tobacco, shawls, linen, and playing cards, and bleaching-grounds and tanneries. In the environs there are numerous gardens, and hops are extensively cultivated.

Manheim was only a village till 1606, when the elector palatine, Frederick IV., laid the foundation of a fortress and a town; he assigned to each of the villagers an allotment of ground, and promised the free exercise of their religion to emigrants driven by religious persecution from Franconia and the Netherlands, numbers of whom resorted thither. In the Thirty Years' War it was taken by Tilly, Duke Bernhard of Weimar, the French, and the Bavarians. In 1688 it was taken by the French general Melac, and desolated like the rest of the palatinate. In 1699 the elector Frederick William collected the scattered inhabitants, encouraged new settlers, and had the city fortified on Coehorn's system. His successor Charles Philip removed hither from Heidelberg in 1720, with his court and all the public officers, on account of the religious disputes with the Protestants. The first stone of the splendid palace was laid in 1720, and the building was completed in 1731. The next elector, Charles Theodore, founded many of the still existing literary and scientific institutions; but on the death of Maximilian Joseph, elector of Bavaria, in 1788, without issue, he succeeded him, and removed his court to Munich, which was a great loss to Manheim. It was taken, as already observed, by the French in 1795, by the archduke Charles in 1799, afterwards re-occupied by the French, and assigned to Baden by the treaty of Luneville in 1801. It has recovered in a great degree its former prosperity during the peace that has continued since the fall of Napoleon, and the population is now about 23,000 inhabitants.

(Sophie de la Roche, *Briefe über Manheim*; Helmina von Chezy, *Heidelberg*, *Manheim*, &c.; Hassel, *Geographie*; Stein, *Lexicon*; Cannabich, *Geographie*, &c.)

MANHEIM GOLD, a species of brass, which, according to Wiegleb, consists of three parts of copper and one part of zinc.

MA'NIA. [Insanity; Lunacy.]

MANICHÆANS, an heretical Christian sect, who derived their name from Mani, as he is called by the Persians and Arabians, or Manes or Manichæus, according to the Greek and Roman writers. The particulars of the life and death of this individual are variously reported by the Greek and Oriental writers; but it appears from all accounts that he was a native of Persia, or at least brought up in that country; that he was well acquainted with the doctrines of the Magi; that he attempted to amalgamate the Persian religion with Christianity; and that after meeting with considerable success, he was eventually put to death by Varanes I., king of Persia. It is difficult to determine the exact time at which the doctrines of Mani were first promulgated in the Roman empire; but they do not appear to have been known before the end of the third century or the beginning of the fourth.

The Manichæans believed, like the Magi, in two eternal principles, from which all things proceed, namely, light and darkness, which are respectively subject to the dominion of two beings, one the god of good, and the other the god of evil. They also believed that the first parents of the human race were created by the god of darkness with corrupt and mortal bodies, but that their souls formed part of that eternal light which was subject to the god of light. They maintained that it was the great object of the government of the god of light to deliver the captive souls of men from their corporeal prisons, and that with this view he created two sublime beings, Christ and the Holy Ghost, and sent Christ into the world, clothed with the shadowy form of a human body, and not with the real substance, to teach mortals how to deliver the rational soul from the corrupt body, and to overcome the power of malignant matter. Referring to the promise of Christ shortly before his crucifixion, which is recorded by John (xvi. 7-15), that he would send to his disciples the Comforter, 'who would lead them into all truth,' the Manichæans maintained that this promise was fulfilled in the person of Mani, who was sent by the god of light to declare to all men the doctrine of salvation, without concealing any of its truths under the veil of metaphor, or under any other covering. Mani also taught that those souls which obeyed the laws delivered by Christ, as explained by himself the Comforter, and struggled against the lusts and appetites of a corrupt nature, would, on their death, be delivered from their sinful bodies, and, after being purified by the sun and moon, would ascend to the regions of light; but that those souls which neglected to struggle against their corrupt natures would pass after death into the bodies of animals or other beings, until they had expiated their guilt. Their belief in the evil of matter led them to deny the doctrine of the resurrection.

Mani entirely rejected the authority of the Old Testament, which he said was the word of the god of darkness, whom the Jews had worshipped in the place of the god of light. He asserted that the books of the New Testament had been grossly interpolated; and that they were not all written by the persons whose names they bear. The doctrines of the sect were contained in four works, said to have been written by Mani himself, which were entitled respectively 'Mysteries,' 'Chapters,' 'Gospel,' and 'Treasury;' but we know little or nothing of their contents.

Bower, in the second volume of his 'History of the Popes,' has attempted to prove that the Manichæans were addicted to immoral practices; but this opinion has been ably controverted by Beausobre and Lardner, who have shown that they were, on the contrary, exceedingly rigorous and austere in their mode of life.

The disciples of Mani were divided into two classes, one of which was called the *Elect*, and the other *Hearers*. The former were bound to abstain from animal food, wine, and all sensual enjoyments; the latter were considered as imperfect and feeble Christians, and were not obliged to submit to such a severe mode of life. The ecclesiastical constitution of the Manichæans consisted of 12 apostles and a president, who represented Christ; of 72 bishops, who also represented the 72 disciples of Christ; and of presbyters and deacons, as in the Catholic church.

The Manichæans never appear to have been very numerous, but they were spread over almost all parts of the Christian world. Numerous treatises were written against them, the most important of which were by Eusebius of Cæsarea, Eusebius of Emesa, Serapion of Thumis, Athanasius of Alexandria, George and Apollinarius of Laodicea, and Titus of Bostra. Much valuable information concerning this sect may be found in the writings of Augustine, who was for nine years a zealous supporter of the Manichæan doctrines.

The Paulicians are generally considered to be a branch of the Manichæan sect, and are supposed to have appeared first in the seventh century in Armenia, and to have derived their name from Paul, a zealous preacher of the doctrines of Mani.

In the sixth century the Manichæan doctrines are said to have spread very widely in Persia. They continued to have supporters, under their new name of Paulicianism, till a very late period in ecclesiastical history. About the middle of the eighth century the emperor Constantine, surnamed Copronymus, transplanted from Armenia a great number of Paulicians to Thrace; where they continued to exist even after the capture of Constantinople by the Turks. In the eleventh and twelfth centuries the doctrines of the Paulicians were introduced into Italy and France, and met with considerable success.

(Neander's *Kirchengeschichte*; Mosheim's *Ecclesiastical History*; Lardner's *Credibility of the Gospel History*, Works, vol. iii., ed. of 1831; Gibbon's *Decline and Fall*, c. 54; Hyde, *De Religione Veterum Persarum*; D'Herbelot's *Bibliothèque Orientale*, art. 'Mani.')

MANICHORD, a keyed musical instrument, of the spinnet kind, similar in all respects to the clavichord. [CLAVICHORD.]

MANI'LIUS, MARCUS or **CAIUS** (whose name is sometimes written Mallius or Manlius), a Latin poet, who wrote a work on astronomy, called 'Astronomicon,' in five books. We possess no particulars respecting his life, but the opinion of Bentley seems the most probable, that he was born in Asia, and lived in the time of Augustus Cæsar.

Some writers suppose Manilius to be the same person as the Manilius or Manlius of Antioch, the astrologer, mentioned by Pliny (*H. N.*, xxxv. 17), and others the same as Manlius the mathematician, also mentioned by Pliny (xxxvi. 15, s. 6); but the only reason for these opinions consists in the similarity of the names.

The 'Astronomicon' does not appear to be complete. The five books which are extant treat principally of the fixed stars; but the poet promises in many parts of his work to give an account of the planets. The 'Astronomicon' contains several passages which are not unworthy to be compared with some of the best writings of the Augustan age; but the subject gave the author little opportunity for the exercise of his poetical powers. It appears from many parts of the work that Manilius was a staunch adherent of the Stoic philosophy.

A MS. of the 'Astronomicon' was first discovered by Poggio in 1416. The best editions are by Bentley, Lond., 1739, and Stoeber, Argent., 1767. It has been translated into English verse by Creech, Lond., 1700.

MANILLA. [PHILIPPINE ISLANDS.]

MANIPULATION, in chemistry, embraces every part of the subject which is of a mechanical nature, such as the operations of weighing, measuring, the application of heat and electricity, the various modes of effecting solution, precipitation, distillation, and sublimation, and in fact every step in chemical research includes manipulation. It will be impossible therefore to treat of the whole of this subject under one head, and the most important parts of it will be found under their respective letters. [CALCINATION; DISTILLATION; FILTER, &c.] This subject is admirably treated in Faraday's 'Chemical Manipulation.'

MANIS. [PANGOLINS.]

MA'NLII, the name of one of the most illustrious patrician *gentes* of antient Rome. Those most worthy of notice are:—

1. Marcus Manlius Capitolinus, who was consul B.C. 390 (Liv., v. 31), and was the means of preserving the capitol when it was nearly taken by the Gauls (Liv., v. 47), from which he obtained the surname of Capitolinus. He afterwards became a warm supporter of the popular party against his own order, and particularly distinguished himself by the liberality with which he assisted those who were in debt. He publicly sold one of his most valuable estates, and declared that as long as he had a single pound he would not allow any Roman to be carried into bondage for debt. In consequence of his opposition to the patrician order he was accused of aiming at the kingly power. The circumstances attending his trial and death are involved in much obscurity. It would appear that he was accused before the centuries and was acquitted; and that afterwards, seeing that the patrician party were determined on his destruction, he seized upon the capitol, and prepared to defend it by arms. In consequence of this Camillus, his personal enemy, was appointed dictator, and the curiæ (*i.e.* the patrician assembly) condemned him to death. According to Livy, who implies that Manlius did not take up arms, he was thrown down from the Tarpeian rock by the tribunes; but Niebuhr supposes, from a fragment of Dion (xxxi.) compared with the narrative of Zonaras (vii. 24), that he was treacherously pushed down from the rock by a slave, who had been hired for that purpose by the patrician party. (*Roman History*, vol. ii., p. 610, 611, Engl. transl.; Liv., vi. 11, 14, 20.) The house which had belonged to Manlius was razed; and the Manlian gens resolved that none of its patrician members should again bear the name of Marcus. Manlius was put to death B.C. 381.

2. Titus Manlius Capitolinus Torquatus, son of L. Manlius, surnamed Imperiosus, who was dictator B.C. 361. When his father Lucius was accused by the tribune Pomponius on account of his cruelty towards the soldiers under his command, and also for keeping his son Titus among his slaves in the country, Titus is said to have obtained admittance to the house of Pomponius shortly before the trial, and to have compelled him, under fear of death, to swear that he would drop the prosecution against his father. This instance of filial affection is said to have operated so strongly in his favour, that he was appointed in the same year (B.C. 359) one of the military tribunes. (Liv., vii. 4, 5; Cicero, *De Off.*, iii. 31.)

In the following year Manlius distinguished himself by slaying in single combat a Gaul of gigantic size on the banks of the Anio. In consequence of his taking a chain (*torques*) from the dead body of his enemy, he received his surname of Torquatus. (Liv., vii. 10.)

Manlius filled the office of dictator twice, and in both instances before he had been appointed consul: once, in order to conduct the war against the Cærites, B.C. 351; and the second time, in order to preside at the Comitia for the election of consuls, B.C. 346. (Liv., vii. 19-26.)

Manlius was consul at least three times. (Cic., *De Off.*, iii. 31.) In his third consulship he defeated the Latins, who had formed a powerful confederacy against the Romans. In the same campaign he put his own son to death for having engaged in single combat with one of the enemy, contrary to his orders. (Liv., viii. 5-12.)

3. Titus Manlius Torquatus was consul B.C. 235, and obtained a triumph on account of his conquests in Sardinia. (Vell., ii. 38; Eutrop., iii. 3.) In his second consulship, B.C. 224, he conquered the Gauls. (Polyb., ii. 31.) He opposed the ransom of the prisoners, who had been taken at the battle of Cannæ. (Liv., xxii. 60.) In 215 he defeated the Carthaginians in Sardinia (Liv., xxiii. 34, 40, 41); and in 212 was an unsuccessful candidate for the office of Pontifex Maximus. (Liv., xxv. 5.) In 211 he was again elected consul, but declined the honour on account of the weakness of his eyes. (Liv., xxvi. 22.) In 208 he was appointed dictator in order to hold the Comitia. (Liv., xxvii. 33.) The temple of Janus was closed during the first consulship of Manlius. (Liv., i. 19; Vell., ii. 38.)

4. Cneius Manlius Vulso was consul B.C. 189, and appointed to the command of the war against the Gauls in Galatia, whom he entirely subdued. An account of this war is given by Livy (xxxviii. 12-17), and Polybius (xxii. 16-22). After remaining in Asia the following year as proconsul, he led his army home through Thrace, where he was attacked by the inhabitants in a narrow defile and plundered of part of his booty. He obtained a triumph, B.C. 186, though not without some difficulty. (Liv., xxxix. 6.)

MANNA, the concrete juice of the *Ornus Europæa*, a species of ash which is a native of the South of Europe, growing abundantly in Sicily, Calabria, Apulia, &c. The juice exudes spontaneously in warm dry weather, and concretes upon the bark of the tree; the finest manna is however procured by making longitudinal incisions of about three inches long. The manna flows at first in the form of a thick juice, which gradually concretes. The finest kind is called Calabrian or flake manna; it is in pieces of a pale yellowish white colour, is light, rather dry, and brittle, and it bears frequently the impression of the branch on which it concretes. It has a slight peculiar odour, and a sweetish taste, mixed with a slight degree of bitterness, and altogether leaves a disagreeable impression. Its texture is generally granular; but the finer pieces when broken are often hollow, and when examined by the microscope exhibit specular crystals. Manna is perfectly soluble both in water and in alcohol; the crystals deposited by cooling a hot spirituous solution constitute a peculiar variety of sugar, which has been called *mannite*; it differs however from common sugar in not being fermentable. According to Bucholz, 100 parts of flake manna contain about 60 of mannite, mixed with uncrystallizable sugar, purgative principle, gum, &c.

Mannite is composed of

	Prout.	Liebeg.
Hydrogen . .	6·8	7·62
Carbon . .	38·7	40·02
Oxygen . .	54·5	52·35
	100·	99·99

Manna is employed as a gentle laxative, for children or persons of weak habits. It is however seldom exhibited alone, but as an adjunct to other more active medicines, as senna, rhubarb, &c. [ORNUS.]

MANNA, KINDS OF. Besides the genuine manna above described, other sweetish secretions are exuded by some other plants which are usually considered to be kinds of manna. These appear to be all produced in warm and dry parts of the world. The kind which is most abundant is by the Arabs called *toorunjbeen*, which is often translated 'Persian manna,' and is produced by a thorny plant, called by botanists *Alhagi Maurorum*. The genus Alhagi (a name compounded of *haj* and the article *al*) of botanists contains two species, *A. maurorum* and *A. desertorum*, found in India, Egypt, Arabia, the north of Persia, and Syria. Both species are also called *ooshturkhar*, or camel's thorn. *A. maurorum* is alone remarkable for yielding a kind of manna, which by some authors has been supposed to be the Manna of the Wilderness; hence the plant itself was called *Manna hebraica* by Mr. Don. The climate of Persia and Bokhara seems alone suited for the secretion of this manna, which in the latter country is employed as a substitute for sugar, and is imported into India from Caubul and Khorassan. A second kind, which, though less abundant, is more esteemed than the former, is called *sheer khisht*, and is mentioned by Garcias under this name, and described as produced in the country of the Uzbecs. A Caubul merchant reported to Dr. Royle that it was produced by a tree called *gundeleh*, which was about twelve feet high, had a jointed stem, and grew in Candahar. A third kind of manna is called *guzunjbeen*, the produce of a species of Tamarisk, called *guz*, which is considered by Ehrenberg to be only a variety of *Tamariscus gallica*, growing on Mount Sinai, but which has been called *T. mannifera*: by some authors this is supposed to be the Manna of the Wilderness. It is said to be produced also in Laristan and in Irak Ajemi. A fourth kind of manna is produced on *Calotropis procera*, called *ashur*, and its sweet exudation or sugar *shukur-al-ashur*, under which name it is described by Avicenna; Zuccarum al-husar in the Latin translation, ch. 758. A fifth kind, called *bed-khisht*, is described in Persian works as being produced on a species of willow in Persian Khorassan. Besides these comparatively little known kinds of manna, a sweetish exudation is produced on the larch (Larix europea), which forms the Manna brigantiaca, or Briançon Manna of some Pharmacopœias.

MANNINGTREE. [ESSEX.]

MANNITE. [MANNA.]

MANO'METER (from two Greek words, *μανός*, thin or rare, and *μέτρον*, a measure) is the name given to instruments which measure the rarity of the atmosphere or other gas. As however the rarity of a gas is proportional to its elastic force, so long as its temperature and chemical composition remain unchanged, such instruments as measure the elastic force of gases are also, with this restriction, properly termed manometers, and accordingly it is to the latter instruments that the term is most frequently applied, both in this country and upon the Continent.

The 'statical barometer' of Robert Boyle was a manometer of the simplest kind, consisting of an exhausted glass globe suspended from one extremity of a delicate balance, and counterpoised by a metallic weight at the other extremity, the adjustment being made when the atmosphere was in its mean state of density. Any subsequent variation in the specific gravity of the air would, by a known law of hydrostatics, destroy the equilibrium, and the motion of the globe would indicate whether the variation had inclined towards an increase or diminution of density, as in the former case it would ascend, in the latter it would descend.

Captain Phipps, in his north-polar voyage, and Colonel Roy, in order to correct his barometric observations, employed manometers, which gave the elastic tension of the atmosphere. They consisted of glass tubes similar in form to thermometer tubes, and of various sizes. Those of Colonel Roy were from four to eight feet in length, with bores from one-fifteenth to one twenty-fifth of an inch in diameter. The bulb and part of the tube being filled with air of known tension, and the remainder of the tube being partially occupied by a small column of mercury sufficient to cut off the communication between the internal and external air; any variation in the elastic tension of the latter, arising from change of weight, would be accurately measured by the ascent or descent of the mercurial column. For whenever the tension of the atmosphere exceeded that of the contained air, the column would move towards the bulb, and the contrary. But if the change in the tension of the atmosphere were partly attributable to a change of temperature, then the motion of the column would merely measure the difference of the variations in the tension of the internal and external air, because the tension of both would be equally affected by the change of temperature. The bulb was pear-shaped, so that the 'point being occasionally opened, dry or moist air could be readily admitted, and the bulb sealed again without any sensible alteration in its capacity.' (*Phil. Trans.*, vol. lxvii., p. 689.) The manometers of Varignon and Wolf were similar to the preceding.

A more convenient instrument, and one of more general use, consists of a siphon-barometer, the basin of which is enclosed air-tight in a globular or other conveniently shaped vessel, furnished with a number of cocks, by means of which and the pneumatic pump the contained gas may be removed, and other gases successively substituted in its place. If equal parts by weight of different gases be thus successively introduced, they will not be affected by any change which may take place in the surrounding atmosphere, except in so far as such change may affect their temperature; so that, providing the temperature remain constant, the relative tensions of these gases will be accurately measured by the weight of the mercurial column suspended in the longer arm of the barometer, above the level of the mercury in the basin; care being had to allow for any variation in the capacity of the receiver, arising from alteration in the level of the mercury in the basin, and likewise for the small tension always indicated by the barometer immediately previous to the introduction of a fresh gas, arising from the impossibility of forming a perfect vacuum.

If an approximate vacuum be formed in the receiver enveloping the basin of the barometer, and a small quantity of any liquid be then introduced, it will be immediately converted into vapour, and the elastic tension of this vapour will be measured in precisely the same way as that of permanent gases. The receiver is sometimes of sufficient size to contain animals and plants, the effect of which in increasing or diminishing the tension of the enclosed gas is then measured by the rise or fall of the mercury. If this manometer be transported from one place to another, where the temperature is the same, but the force of gravity different, this variation in the force of gravity will be manifested by a corresponding variation in the length of the mercurial column; that is, if the gravity increase, the tension of the enclosed gas will be counterbalanced by a shorter column of mercury, and the contrary; but as this method of measuring the variations in the force of gravity is not susceptible of that accuracy which is attained by the employment of the pendulum, it is rarely, if ever resorted to.

The exact determination of the elastic force of aqueous vapour at high temperatures being essential to the safe construction and management of steam-engines, the French government requested the Royal Academy of Sciences to institute a course of experiments, with a view to the attainment of so important an object. The care of making these experiments was confided by the Academy to MM. de Prony, Arago, Girard, and Dulong, who made their report in 1830. (*Annales de Chimie*, t. xliii., p. 74.) The manometer constructed for this purpose consisted of a straight glass tube of uniform bore, 1·7 mètres (67 inches) in length, and 5 millimètres (1·25 inches) in diameter and thickness, closed at the upper and open at the lower extremity. The capacity having been accurately determined, it was filled with perfectly dry air of known density, and enveloped in a cistern of water, which was kept at an uniform temperature. Another tube of equal bore and thickness, but 26 mètres (85 feet) in length, and open at both ends, was then erected, and the lower extremities of the two tubes were made to communicate with apertures in the opposite sides of a cylindrically-shaped reservoir, capable of holding about 1 cwt. of mercury. By means of a forcing-pump adjusted to the top of this reservoir, the pressure upon the surface of the contained mercury could be increased at pleasure; and this increased pressure, being transmitted to the lateral apertures already mentioned, would obviously cause the mercury to rise in both tubes, but to unequal heights; for in the longer tube it would rise until the weight of the mercurial column, together with that of the superincumbent atmosphere, were equal to the pressure; but in the shorter tube, only until this pressure was counterbalanced by the rapidly augmenting expansive force of the confined air, added to the weight of the small column of mercury forced into it. The expansive force of the compressed air would be measured by the difference of these two columns; and by this means, the shorter tube having been carefully graduated corresponding to pressures varying from one to twenty-nine atmospheres, the construction of the manometer was complete. The longer tube and the forcing-pump were then removed, as no longer necessary, and instead of the latter was substituted the actual pressure of steam at successively increased temperatures, the tension of which was indicated by the compression of the air in the manometer.

(For more minute information see the *Annales de Chimie*, as above cited; also Poisson, *Méchanisme*, &c.)

(See Poisson, *Mécanique*, tom. ii., p. 612-14; Biot, *Physique Experimentale*, i., p. 244; Gehler's *Dictionary of Physics*, iii. 135, v. 623; Fischer's *Ditto*, art. 'Manometer;' Sir H. Davy, in Nicholson's *Journal*, iv., p. 32; Gilbert's *Journal*, xv., p. 61; *Edinb. Phil. Jour.*, part i.)

MANON, a genus of Zoophyta, proposed by Schweigger, adopted by Goldfuss, and ranked by De Blainville among the Amorphozoa, with spongia, alcyonium, &c. It is an attached mass, full of lacunæ, composed of reticulated fibres, with its surface pierced by many distinct holes. Goldfuss gives nine species, of which five are from the chalk, two in Jura kalk, one in transition rocks.

MANOR (*Manerium*).

I. *Origin of Manors.*—At the time of the Norman conquest manerius or manerium (from *manere*, to dwell) denoted a large mansion or dwelling. The 'manerium' of the Exchequer Domesday is the 'mansio' of the Exeter Domesday, each being therefore the equivalent of the Anglo-Saxon or French term used by the officers who made the survey. [EXETER.] In France the corresponding word 'manoir' has never acquired any other signification than that of a mansion; and an estate possessing the peculiar incidents of an English manor never became so common in France as to require a specific name.

The modern English manor derives its origin from subinfeudation [FEUDAL SYSTEM], as it existed before the modifications of the system of tenures introduced in 1225 by Magna Charta, and the still more important alterations made in 1290 by 'The King's Statute of buying and selling Lands,' commencing with the words 'Quia Emptores Terrarum,' and in 1324 by the statute 'De Prærogativâ Regis,' by which statutes, the process of subinfeudation, or of granting land, &c. in fee-simple, to be held by the grantee as a tenant or vassal to the grantor, was stopped.

Where a subinfeudation made by A to B extended to the whole of A's land, nothing remained in A but a seigniory with the ordinary feudal incidents of tenure, together with such rents or other services as might have been reserved upon the creation of the subtenure. This interest in A was a seigniory in gross, that is, a seigniory held by itself, unattached to any land, an incorporeal seigniory, termed by the French feudists 'un fief *en l'air*.' But in the case of subinfeudation of *part* of the land, the ordinary mode of proceeding was this:—A, a large proprietor, having a mansion and land at Dale, created a subtenure in a portion of his land by granting such portion to B and his heirs, to hold of A and his heirs, as of A's manerium (mansion) of Dale, which words created an implied condition that B should perform the service of attending, with the other tenants of A holding by virtue of similar subinfeudations, at A's halmote of Dale, that is, at A's court meeting in the hall of A's mansion at Dale (afterwards called A's court-baron of his manor of Dale), for the purpose of deciding judicially all disputes among A's free tenants holding of him by the same tenure as B, in respect of their lands so holden, and also all actions brought by persons claiming such lands.

Upon this subinfeudation being effected, A would continue to be the owner of the mansion of Dale and of that part of the land of Dale, of which he had made no subinfeudation, in demesne (in dominico suo),—as his own immediate property; and he would have the seigniory of lands of which B and others had been subinfeoffed, as a seigniory appendant or legally annexed to the mansion of Dale, and to the demesnes of Dale, of which the mansion formed part.

This conjoint or complex estate, taking its denomination from the mansion (manerium), which was considered as its head, and which, in the language of the Year Book of P. 14, Edward II. (Maynard, 426), 'drew to itself all the appendancies,' by degrees acquired the name of manerium or manor.

A manor therefore *originally* consisted of lands in demesne, upon which the lord had a mansion, and to which lands and mansion, and more especially to the latter, there was appendant a seigniory over freeholders qualified in respect of quantity of estate (*i.e.* by a tenancy for life at the least, if not a tenancy in fee-simple), and sufficient in point of number, to constitute a court-baron. These freeholders were called vavassors [VAVASSOR], and their lands 'tenemental lands,' *i.e.* lands granted out in tenure, to distinguish them from the lord's demesnes. These tenemental lands, antiently known by the denomination of vavassories, though held of the manor and within the seigniory (or, as it was usually termed, within the fee) of the lord, were not considered as part of the manor; but the services issuing from such tenemental lands were part of the manor and essential to its existence.

Afterwards it was sufficient if the site of a mansion at which the services had been reserved, or, as it was called, the site of the manor, formed part of the demesnes; and, at last, this vestige of the origin of the name of the estate was dispensed with, and if the lord retained any portion of the land, so that there would be some demesnes to which the seigniory over the freehold tenants of the manor, and the services rendered by them, might continue to be appendant, the compound estate called a manor was not dissolved, whether it could be shown that a mansion had ever stood on the part of the demesnes or lands retained, or not, and even if the lord had aliened and severed from his demesnes the spot on which the mansion had once stood.

II. *Nature and incidents of Manors.*—A manor is commonly said to consist of demesnes and services. It is quaintly, but perhaps more correctly, stated by Fulbeck, that these 'are the material causes of a manor;' for though there can be no manor unless there be both demesnes and services, other things may also be members and parcel of a manor.

1. The demesnes are those lands within the manor, of which the lord is seised, *i.e.* of which he has the freehold, whether they are in his own occupation, or in that of his tenants at will, or his tenants for years. The tenants at will have either a common-law estate, holding at the joint will of the lessor and of the lessee, or a customary estate, holding at the will of the lord according to the custom of the manor. [Copyhold.] The tenancy for years of lands within a manor is, in modern times, usually a common-law estate, though in the assessionable manors, parcel of the duchy of Cornwall, customary estates for years still subsist (VIII.); and where a copyholder surrenders for years, the surrenderee becomes a customary tenant for years of the portion of the demesnes so surrendered.

2. The services of a manor are, the rents, and other services, due from freehold tenants holding of the manor. These services are annexed or appendant to the seigniory over the lands holden by such freehold tenants. The lands holden by the freeholders of the manor are holden *of* the manor, but are not *within*, or *parcel of*, the manor, though within the lord's fee, or manerial seigniory.

Copyholds, being part of the demesnes, are not held of the manor, but are within and parcel of the manor.

The demesne lands were formerly called the *inland*, and the tenemental lands, the *outland*, of the manor.

3. But though a perfect legal manor cannot exist without demesnes and services, other incorporeal hereditaments, which are not services, may be parcel of the manor, as advowsons, rights of common, rights of way, &c., and, under peculiar circumstances, even rents-seck and rents-charge.

In general, the power of holding courts of justice, whether for the decision of criminal matters or for the determination of civil rights, can be exercised only under authority derived from the crown, either by actual grant or by prescription; and in order to prevent usurpations of such a power, the crown may at any time issue process for the purpose of instituting an inquiry by what authority [Quo Warranto] a subject holds a court of justice. But it is a distinguishing feature of the feudal system, to make civil jurisdiction necessarily, and criminal jurisdiction ordinarily, coextensive with tenure. Upon this principle there is inseparably incident to every manor a court-baron (curia baronum), being a court in which the freeholders of the manor are the sole judges, but in which the lord, by himself, or more commonly by his steward, presides. The jurisdiction of the court-baron extends over all personal actions in which the debt or damages sought to be recovered are under 40*s.*; and real actions in respect of lands held of the manor could not have been brought in any other court, except upon an allegation that the lord of the manor had in the particular instance granted or abandoned his court to the king (quia dominus remisit curiam). To a quo warranto therefore for holding a court-baron, it is a sufficient answer—that the defendant has a manor. As this court was essential to the due administration of justice in questions respecting the right of property held of the manor arising amongst the lord's tenants, there could never have been a perfect manor without a sufficient number of freeholders to constitute the court-baron, which number must consist of three, or two at the least; three being necessary where the litigation was between two of the freeholders. The practice, which prevailed in France, &c., of *borrowing* suitors from the court of the lord paramount, to make up a sufficient number of freeholders to constitute a court, does not appear to have been adopted in England.

4. Some things are popularly supposed to be incident to a manor, which have no necessary connexion with it. Thus the ownership of wastes within the district over which the manor extends, is frequently called a *manerial* right, though the right and interest of the lord in wastes, over which no acts of ownership can be shown to have been exercised by him, rests entirely upon the presumption in favour of the lord, arising out of the circumstance of his being the present owner of the demesne lands, and the former owner of the tenemental lands which adjoin such wastes. The same presumption would arise in favour of any other owner of an extensive district. It is however true that lords of manors in their original grants, both to their freehold and to their copyhold tenants, usually reserved the waste lands, giving to the freeholders and copyholders merely rights of common over the wastes. Hence it arises that, in point of fact, manors, in proportion to their extent, frequently contain a much larger portion of wastes than other estates. From this cause, and from the circumstance of manors being generally large properties in the hands of the nobility and gentry, several statutes have given to lords of manors privileges in respect of game, and the appointment of gamekeepers, which other estates, though they may be of greater extent and value, do not enjoy. But except in particular cases in which a free-chase, free-warren [Warren], or legal park [Park] is, by royal grant or prescription, annexed to a manor, the lord of a manor has no privilege, in respect of game, beyond what is given him by these modern statutes.

Copyholds are a common incident to the demesnes of a manor, but there are many manors in which this species of tenure does not appear to have ever existed, and many more in which it has been long extinct; and though there are now no copyholds unconnected with a manor, the custom of demising by the lord's rolls appears to have formerly been common to every lord or freeholder who had demesnes which were held in villenage. So the right to have a court-leet is a royal franchise [Leet], under which the grantee holds a court of criminal jurisdiction in the king's name, over the resiants (residents) within a particular district. This privilege may be granted to persons who are not lords of manors; and where the grantee has a manor, the limits of the manor and of the leet are not always co-extensive.

Confusion often arises in the use of the terms 'within the manor,' 'within the fee and seigniory of the manor,' and 'within the ambit of the manor.' The first of these terms (and its equivalent 'parcel of the manor') applies to lands, &c., in the actual possession of the lord, or of his leaseholders or copyholders; the second, to lands which, having been formerly within the manor, were, before the statute of Quia Emptores, or De Prærogativâ Regis, granted by the lord to be held of the grantor in fee, as of his manor; the term 'within the ambit of the manor' is applicable to land, which though surrounded by the manor, is neither parcel of the manor nor held of the manor; land which never was connected with the manor in point of tenure, or which having been formerly within the manor, has been in some way alienated from it in fee.

III. *Manors, how created.*—Since the statutes of Quia Emptores and De Prærogativâ Regis no manors have probably been created; and it has been commonly said that no new manor could afterwards be created. But as a proposition of law this appears to be stated too broadly. The former statute has been held not to apply to the immediate tenants of the king, who is not one of the 'magnates and other (*i.e.* inferior) lords.' The latter statute speaks only of lands held by knight's-service, and therefore, like the clause in the statute of wills imposing a restriction upon the devising of lands of that tenure, appears to be inapplicable since the abolition of military tenures. Besides, the statute of Quia Emptores Terrarum has been held to contain an implied exception in respect of alienations made with the licence of all lords, mediate or immediate; and in the statute De Prærogativâ Regis we find an express exception in favour of alienations made with the licence of the king. It seems to be questionable whether, even by the common law, the immediate tenant of the crown did not incur a forfeiture by making a subfeoffment without licence. (34 Edw. III., c. 15.) It has also been objected that a court-baron is necessary to a manor, and that a man cannot, by granting lands in tail, reserving suit at his court, create a court-baron. But this objection assumes that no greater subtenure can now be created than an estate tail; whereas, *with licence*, a subtenure in fee may be created, and the holding of a court-baron seems to be incidental at common law to the seigniory over tenants in fee-simple.

Practically however no entirely new manors are now created; but where, upon the partition of a manor, part of the demesnes and part of the services, including suit of court of a sufficient number of freehold tenants to constitute a court-baron, are assigned to one parcener, joint-tenant, or tenant in common, and other parts of the demesnes and services to another parcener, &c., each party has a manor, and may hold a court-baron. And it is said that if a manor extends into several townships, the lord may create separate manors by conveying the demesnes and services in township A to one, and those in township B to another.

It has been said that the king cannot at this day create a manor. From the nature of this species of estate it is obvious that the king never could create a manor. If the crown granted land to A, he might, with the licence of the crown, subinfeoff B, C, and D of parcels of the lands, retaining the mansion, with or without other demesnes, in his own hands, and stipulating with B, C, and D, that they should render their services at such mansion. A would then have a manor; but it would not have been created by the crown, as the king neither did nor could create the subtenures of B, C, and D, out of which arose the services that, in conjunction with the demesnes, constituted the manor.

IV. *Manors, how destroyed.*—A manor is not destroyed by the loss of those incidents which, though members, and forming part, of the manor, are not, like demesnes and services, the 'material causes of a manor.' Nor will the legal existence of the manor be affected by the alienation of *part* of the demesnes, or by the alienation or extinction of *part* of the services, or by the extinction of all the copyholds. But upon the alienation of all the demesnes, or the alienation or extinction of all the services, the manor ceases, and is said to be destroyed: and though any part of the demesnes, however small, will keep alive the manor, if there be sufficient services, it can exist no longer than whilst there can be found enough freehold tenants to constitute a court-baron. Thus if the lord purchase the lands of all his freehold tenants, or of all except one, or if the freeholds escheat, or if the lord release or alien the services, the manor ceases to exist. So, if the lord alien the freehold of all lands holden of him by copy of court-roll, or enfranchise all the copyholders, in a manor where there are no demesnes except the copyholds. So, if he alien all the demesnes. So if, upon a partition of the manor, the demesnes are allotted to one and the services to another. But in none of these cases is the destruction of the manor absolute and irrevocable. If there cease to be any demesnes, so that the manor is turned into a seigniory in gross, yet upon the event of any of the freeholds holden of the manor coming to the lord by escheat or purchase, the lands so escheating or purchased will become demesnes of the manor, as they were, before the subinfeudation of those lands, whereby they were originally severed from the manor, took place. Where a manor is destroyed by partition between co-parceners, if one die, and the other takes the share of the party dying as heir, the manor revives; but it would not be so in the case of a partition between joint-tenants or tenants in common, nor would the manor revive in the case of co-parceners if the severed portion of the manor were re-united, not by descent, but by purchase. Where all the freehold tenants have ceased to exist except one, there is no longer a complete legal manor, because there can be no court-baron; but if the remaining tenant convey his tenement in fee to different persons in severalty, as there will be now a sufficient number of freeholders holding of the manor, to constitute a court-baron, the manor will revive. But without such revival, the estate is by some lawyers considered to be still entitled to the designation of a manor, by reason of there being demesnes and a seigniory appendant, though over one tenant only. (1 Anderson, 257.) Such an estate is however more frequently called 'a manor by reputation,' a vague term, applied indiscriminately to all estates which have been manors, and which indeed would be equally applicable to a property which had acquired the name of a manor without having ever been one.

If the lord of a manor make a gift in tail, or a lease for life, of all the demesnes, this is such a severance and alienation of the demesnes from the manor, that there will, during the continuance of the particular estate, be no demesnes within the manor. Whilst the estate tail, or the estate for life, continues, the *services* of the entailee, or tenant for life, and the reversion expectant upon the determination of such estate, will be parcel of the manor, but the *land* itself will be *holden of* the manor, and will not be *parcel* of the manor. Instead of demesnes, and services, the lord will, for the time, have merely two classes of services, viz. those of the entailee, or tenant for life, and those of the antient freeholders in fee. During the continuance of this state of things the manor will be in suspense, and the lord will have, not a manor, but a double seigniory in gross, or rather two conjoint seigniories, one in respect of the entailee, or lessee for life, the other in respect of the antient freehold tenants of the manor in fee.

V. *Manors, Customary.*—So much importance formerly attached to the possession of a principal mansion at which the services of tenants might be rendered, that a person holding lands in customary villenage might grant portions of his villenage to be holden of the grantor, for as great an estate as the grantor had, as of his mansion or manerium. The estate of the grantor, which, after this operation, would consist of the mansion and the other ungranted portions of the villenage, with the services of the grantees appendant thereto, was called a customary manor.

The estate of a person to whom the lord of a manor has granted the freehold and seigniory of all the copyholds within the manor or within a certain district, has been sometimes loosely called 'a customary manor.' But such an estate cannot, in any sense, be said to consist of demesnes and services.

VI. *Manors in Antient Demesne* are those manors, which, though now mostly in the hands of subjects, formed part of the royal domain at the time of the Conquest, and are designated in Domesday as 'terra regis.' The peculiarity of these manors is, that there exists in them a particular class of tenants possessing certain customary privileges, supposed, by Lord Coke and others, to be derived from the indulgence of the crown in matters 'pertaining to the king's husbandry.' They were formerly called 'tenants in socage in antient tenure,' but are now commonly known as 'tenants in antient demesne,' a term not in itself very accurate, since all tenants within these antient demesne manors, whether copyholders or leaseholders, and even the lord himself, are strictly speaking tenants *in* antient demesne. In these customary tenures the freehold is not in the lord, but in the tenant, who is therefore called a customary *freeholder;* and it does not appear to be necessary to the continuance of the manor that there should be any other freehold tenants, though lands may be held of a manor in antient demesne by the ordinary freehold tenure, which lands are called lands in frank-fee by way of distinguishing them from the customary freeholds held by the 'tenants in socage in antient tenure,' now called 'tenants in antient demesne.'

Lord Coke enumerates six privileges as annexed to this peculiar tenure. (4 *Inst.*, 269; Bac., *Abr.*, 'Antient Demesne;' Com., *Dig.*, 'Antient Demesne.')

VII. *Manors in Border Counties.*—The exposed state of the northern borders of England, liable to hostile incursions in time of war, and scarcely less in times of nominal peace, created a peculiar species of tenure in the manors in the four northern counties. Persons holding by this tenure are called customary freeholders; though here the *freehold* is in the lord, and the timber and mines belong to him, and not (as in the tenure in antient demesne) to the tenants; but they are so called because they are allowed the privilege of passing their estates, as freeholders do, by feoffment and livery, a privilege perhaps derived from the irregularity with which the customary courts of the manor were held, and from the necessity of allowing persons whose tenure of land and of life was so uncertain to make immediate dispositions of their property.

VIII. *Manors, Assessionable,* a term peculiar to that part of the domain of the duke of Cornwall [Wales, Prince of] which is situate within the county of Cornwall, con seventeen manors, namely, Launceston, Trematon

Restormel, Stoke-Climsland, Tybeste, Tewington, Helston-in-Kerrier, Moresk, Tywarnhaile, Penkneth, Penlyn, Rellaton, Helston-in-Trigshire, Liskeard, Calstock, and Talskydy.

The earls and dukes of Cornwall, and, when no earl or duke, the crown, have sent from time to time (commonly every seven years) certain persons commissioned to visit these manors in succession, and to *assess* the lord's demesnes, *i.e.* to let them at such rents and upon such terms as might appear to them to be advantageous to the duchy. The courts held by the commissioners for the purpose of exercising the authority thus delegated to them were called *assessions*, or courts of *assession*. The course usually was to let the land until the next assession. From the conventions (covenants or engagements) entered into by the persons to whom those demesnes were so arrented, the interest demised was called a tenure *in conventione*, and the tenants were styled conventionaries. These demises were made both to freemen and villeins; the former being called free conventionaries, the latter villein or native conventionaries. The latter class appear to have become extinct in the 16th century.

By degrees the conventionary tenants acquired an inheritable interest in the certainty of the renewal of their holdings in favour of themselves and their descendants at each successive assession. The conventionary tenant thus acquired, like a copyholder of inheritance, an interest freehold in point of duration, without a freehold tenure.

In conventionary tenements the minerals belong to the lord, and not to the customary tenant; as it was held upon a trial at bar in 1829, which lasted seven days (*Rowe* v. *Brenton*, 3 Mann. and Ryl., 133-364.)

MANS, LE, a town in France, capital of the department of Sarthe, situated on the river Sarthe, in 48° 1′ N. lat. and 0° 11′ E. long.; 111 miles from Paris in a direct line west-south-west, or 122 miles by the road through Versailles and Chartres.

This town existed in the time of the Romans, and was called Suindinum. It was the capital of that division of the Aulerci called Cenomani or Cenomanni, from whom it took in the fourth century the name of Cenomanni, a fragment of which remains in its modern designation. In the age of Charlemagne it was considered one of the principal cities of France. It was the chief town of the province of Maine. It is said to have been besieged twenty-four times between the reign of Clovis and that of Henri IV. inclusive. It was occupied by the royalists of Vendée in A.D. 1793, to the number of 60,000. They were driven out by General Marceau with the loss of many men and much plunder. It was surprised by a party of Chouans in A.D. 1799.

The town stands on the left bank of the Sarthe, a little above its junction with the Huine, and consists of two parts or quarters. The old quarter, on the bank of the river, consists of four or five streets nearly parallel to each other, narrow, dark, and dirty, connected by lanes or passages, some of which have steps, while others are so steep as to be impracticable for horses and carriages. The new quarter, on a hill not immediately adjacent to the river, occupies a larger space than the old, and has an equal population: it is well built and agreeable, though irregularly laid out. The Place des Halles is the largest and finest in the town. The Place des Jacobins, planted with trees, was formed, together with an adjacent public walk, in 1790, on the suppression of the religious houses. The walk covers the site of a Roman amphitheatre, which was discovered by the workmen in laying it out. There is another public walk on the bank of the Sarthe. The principal building is the cathedral, built on the foundations of an antient temple. The nave is the most antient part, and is ascribed to the ninth century by some, but to the eleventh by others: the choir and transepts are of later date, perhaps of the fifteenth century. The choir is admired for the loftiness of its roof, the boldness of its architecture, and the beauty of its stained glass. There is a tower at the extremity of one of the transepts, rising above 200 feet from the ground. The cathedral is surrounded by thirteen small chapels. There are several other churches: that attached to the seminary for the priesthood and the Church of the Visitation are modern buildings. That of La Couture, formerly conventual, is antient. The abbey of St. Vincent is now occupied as the seminary for priests; it has a fine front: the building formerly used for the seminary is now a barrack. The high school is held in an old monastic building, and the abbey of La Couture has been converted into the prefect's office rooms in it are occupied by a public library of 40,000 or 50,000 volumes, and 700 MSS., a museum of natural history, and a collection of paintings. The town-hall is built on the site of the former palace of the counts of Le Mans, which itself occupied the site of some Roman building, of which there are yet some remains. The court-house is well laid out, and there is a theatre. The houses in the town are chiefly built of stone, and covered with slate.

The population in 1831 was 19,672 town, 19,792 whole commune; in 1836 it was 23,164 for the commune. There are considerable manufactures of woollens, cottons and linens, hosiery, lace, wax candles, and soft soap. There are bleaching establishments for linen and wax, tan-yards, currying-shops, paper-mills, and breweries. Considerable trade is carried on in the manufactured articles and in the agricultural produce of the neighbourhood, including chesnuts, walnuts, dried fruits, fat fowls, which are sent to Paris, and trefoil seed, sent to Russia, Sweden, and England. The weekly cattle-market is well attended; and there are two yearly fairs of eight days each. The town is the emporium of the surrounding country. There are good inns, coffee-houses, reading-rooms, and public baths.

There are several fiscal or judicial government offices, a seminary, and a high school, a society of agriculture, sciences, and arts, a royal society of arts, a free school for drawing, an hospital, and some other charities. It is the seat of a bishopric, the diocese of which includes this department and that of Mayenne: the bishop is a suffragan of the archbishop of Tours.

The arrondissement of Le Mans comprehends ten cantons or districts, each under a justice of the peace, and 116 communes. The area of it is 734 square miles. The population in 1831 was 157,851; in 1836, 164,667.

MANSARD, the name of two French architects of great celebrity in the seventeenth century. François Mansard, the elder, whose father, Absalon, is said to have been architect to the king, or at least a builder in the royal service, was born at Paris in 1598. At the age of twenty-two he began to distinguish himself by his restoration of the Hôtel Toulouse; and a short time afterwards he was commissioned to execute the portal of the church of the Feuillans, in the Rue St. Honoré. The reputation he acquired by these works soon procured him abundant employment, and obtained for him ample opportunities for displaying his talents. Among the numerous châteaux erected after his designs, may be mentioned Berni near Paris, Baleray, Blerancourt, Choisy, and that of Maisons, which last was built for the president De Longueil, and is generally considered his *chef-d'œuvre* among his edifices of that class.

Among his churches the most noted is that of the Val de Grace at Paris, the dome of which, said to have been designed after that of the chapel of the Château de Fresnes, built by himself, has been generally extolled as a fine piece of architecture, although now it would be considered a grotesque composition remarkable for nothing so much as the impure and meagre taste it displays, many of the forms being absolutely barbarous. The façade of the church of the Minimes in the Place Royale is also by him; and has been admired as exhibiting the solution of a knotty problem, the metopes being perfect squares throughout! Such was the puerile and pedantic trifling that formerly engaged the attention of architects and connoisseurs, and for the sake of which they overlooked matters of infinitely greater importance in architectural taste and design.

François died in 1666. This architect is said to have been the inventor of the curb roof, called, after him, a *Mansard*, which consists of two planes on each side, a steeper one below and a flatter one above. It has however little beauty of form to recommend it, having very much the look of being broken or doubled.

MANSARD, JULES HARDOUIN, was the nephew of the preceding, being the son of a painter who had married the sister of François. Jules, who assumed his maternal family name on becoming heir to his uncle, was born in 1648. He was brought up by François to his own profession, in which he afterwards so greatly distinguished himself, as to become much the more celebrated of the two. Most assuredly he had ample field allowed him for the display of his talents, since, had he been employed on no other work, he was called to execute one which for lavish prodigality has hardly its parallel in any age or country. It becomes therefore quite as much a satire as a eulogium on his 'genius' to say that on that occasion, and with unlimited resources, he produced nothing better than Versailles—a huge pile of building, which our own eminent architect Sir C. Wren described as composed of 'heaps of littleness.' Even his biographer Quatremère de Quincy, though anxious to impress us with a high idea of his talents, is obliged to admit that his designs display 'une certaine mediocrité de goût,' to which he might have added, a mediocrity of ideas also. It would not be difficult to select from his works numerous instances of exceedingly bad taste, of puerile caprices, and downright solecisms. Undoubtedly the magnitude and the costliness of their decorations give them an imposing air, but the effect thus produced is not to be ascribed to the architect himself—at least he must consent to share the fame so derived to him, with others. After Versailles, the work which has chiefly contributed to his reputation is the dome of the Invalides at Paris, which, although as splendid as a coat of gilding can make it, is externally greatly inferior to that of our St. Paul's in harmony and majesty of design and proportions. The plan of the interior of the edifice presents far more that deserves commendation, the whole being most skilfully arranged for perspective effect. Both the Place Louis XIV. and that called Des Victoires at Paris were built after his designs, but have little at all remarkable, except it be that the one is an octagon, and the other an oval in plan.

With abundance of most lucrative employment, and enjoying the personal favour of a monarch who was uniformly lavishly profuse, and by whom many profitable appointments were bestowed upon him, it is no wonder that Jules Hardouin was enabled to amass a vast fortune. He died suddenly at Marly in 1708, in his sixty-third year, and was buried in the church of St. Paul, at Paris, where a monument was erected to him, executed by the sculptor Coysevox.

MANSFIELD, a market-town and parish in the northern division of Broxton wapentake, in the county of Nottingham. The population of the parish in 1831 was 9426. The town is seated in a valley near the little river Mann, or Maun, from which it probably takes its name, and is surrounded by the antient forest of Sherwood, the scene of Robin Hood's chief exploits. [Hood, Robin.] Its direct distance from Nottingham is 12 miles north by west, and from London 128 miles north-north-west. The parish church, dedicated to St. Peter, is commodious; the living is a vicarage in the diocese of York and patronage of the dean of Lincoln, producing a net revenue of 158*l.* The principal streets are paved, and lighted with gas. A railway, seven miles in length, has been constructed at an expense of 30,000*l.*, connecting Mansfield with the Cromford canal, which is said to have proved very advantageous to the trading interests of the place. There are some extensive cotton-mills, besides manufactories of hosiery and lace. The market-day is Thursday, and the cattle-fairs are held on the 5th of April, 10th of July, and the second Thursday in October. The free grammar-school was founded by royal charter in the third year of the reign of Queen Elizabeth, who also established two scholarships of 10*l.* each at Jesus College, Cambridge, for scholars from this school. The insufficient state into which this school had been allowed to fall was a subject of general complaint among the inhabitants as recently as the year 1832. According to the charter of foundation the salaries of the master and usher are to be paid out of the produce of the church lands, which it is declared shall be distributed in the proportion of two-thirds to the vicar, two-ninths to the master, and the remaining one-ninth to the usher; and it appears that the master's share amounted to 115*l.* in 1833, when the number of scholars, including eight boarders, was twenty-seven.

In 1725 Faith Clarkson bequeathed 2000*l.*, part of which she directed should be appropriated to the erection of a charity-school in Mansfield, and the remainder invested in lands for charitable purposes. By a decree of the court of chancery in 1743 it was ordered that a portion of the rental of these lands should be applied to the maintenance of a master and mistress to instruct twenty poor boys and the like number of girls, in reading, writing, and arithmetic; the remainder was allotted to the clothing of all the children, and apprenticing a certain number of the boys. There is ample information as to the grammar-school and the other charitable institutions of Mansfield, in the Twenty-fifth Report of the Charity Commissioners, and in the second volume of Throsby's edition of Thoroton's *History of Nottinghamshire*, 4to., 1797.

In the neighbourhood of Mansfield-Woodhouse, a village about a mile and a half from the town of Mansfield, two Roman villas were discovered by Mr. Rooke in 1786; and in the vicinity of Mansfield numerous coins of the emperors Vespasian, Constantine, Antoninus Pius, and Marcus Aurelius have been found at different times.

(Horrod's *Hist. and Antiquities of Mansfield*, 4to., 1801; and *Parliamentary Papers*.)

MANSFIELD, WILLIAM MURRAY, EARL OF, lord-chief-justice of the king's bench, was born at Perth on the 2nd of March, 1704, o.s. He was the fourth son of Andrew Viscount Stormont. At the age of three he was removed to London, and in 1719 he was admitted a king's scholar at Westminster school. On the 18th of June, 1723, he was entered at Christ Church, Oxford, where, as before at Westminster, he distinguished himself by his classical attainments. After taking his degree of M.A. he left the university in 1730, and after travelling some time abroad he was called to the bar in Michaelmas term, 1731. In early life he appears to have associated a good deal with the 'men of wit about town.' Dr. Johnson said of him that 'when he first came to town he drank champagne with the wits.'

It has been said of him, as of other eminent lawyers, that he had been heard to say that he never knew the difference between a total want of employment and an income of 3000*l.* a year. But in 1732, the year after his being called to the bar, it appears that he was engaged in an important appeal case; and in the two following years he was frequently retained in similar cases before the House of Lords. (Holliday's *Life*, p. 28.) The first cause in the common-law courts in which Mr. Murray distinguished himself was an action for criminal conversation brought by Theophilus Cibber against Mr. Sloper. A sudden attack of illness having prevented his leader from appearing in court, the duty of conducting the defence devolved upon him. The result brought him an influx of business which at once raised his income from a few hundreds to thousands. In 1743 he was appointed solicitor-general, and obtained a seat in the House of Commons, where his eloquence and legal knowledge soon rendered him very powerful.

In the House, Murray and Pitt (Lord Chatham) were opposed to each other as the best speakers of their respective parties. Pitt's attacks on Murray seem to have occasionally exceeded the limits prescribed by modern parliamentary regulations. 'Brilliant and argumentative as was the oratory of Murray,' says Mr. H. Roscoe (*Lives of Eminent British Lawyers*, p. 180, in *Cabinet Cyclopædia*), 'he did not always possess the nerve necessary to ward off or to return assaults so terrible as these, and for the most part he bore in agitated silence the attacks to which he did not venture to make any reply.'

In 1754 Mr. Murray was made attorney-general, and in 1756 he received the appointment of chief-justice of the king's bench, and was immediately created a peer, by the title of Baron Mansfield, of Mansfield in the county of Nottingham. On his elevation to the seat of chief-justice, Lord Mansfield, contrary to the general usage, became a member of the cabinet.

Few lawyers have been more tempted than Lord Mansfield to quit their profession for politics. On several occasions (such was his power as a speaker and such was the opinion entertained of his abilities by his party) high political office, with the prospect of higher, of indeed the highest, was pressed upon his acceptance. But whether it was prudence or a certain timidity of character which appeared in him on many occasions throughout his life, that guided his conduct, it is certain that he was firm in refusing all offers of the kind and in adhering to his profession. Thus when the duchy of Lancaster and a pension of 2000*l.*, with the reversion of a valuable post for his nephew, Lord Stormont, were offered to him, and subsequently the amount of the proposed pension was raised to 6000*l.*, he was firm in his refusal. 'He knew,' says Walpole, 'that it was safer to expound laws than to be exposed to them; and he said peremptorily at last, that if he was not to be chief-justice, neither would he any longer be attorney-general.' Shortly after Lord Mansfield's promotion to the bench, on the dismissal of Mr. Pitt, and the resignation of Legge, the chancellor of the exchequer, the seals of the latter office were *pro tempore* placed in the hands of Lord

Mansfield, and he was entrusted by the king with full power to negotiate on the subject of a new administration with Mr. Pitt and the Duke of Newcastle. The same reasons which made him refuse political office seem to have induced him to decline the custody of the great seal when it was, upon more than one occasion, offered to him. He preferred the purely judicial office of chief-justice of the king's bench, where he was safe from political storms and the vicissitudes which they produce. Yet in that office, though safe from political, he was not safe from popular storms. His political leanings were not towards the popular side; and even his conduct as a judge, though now, when at a distance from him and his time we can survey it with calmness, it may appear deserving of a very small portion of the reprehension heaped on it by such writers as Junius, was at the time not free from the appearance of some bias against popular rights. The following passage from a speech of his in the House of Lords gives his opinion on the subject of seeking popularity, for which he always entertained a great contempt. 'It has been said by a noble lord on my left hand, that I likewise am running the race of popularity. If the noble lord means by popularity that applause bestowed by after-times on good and virtuous actions, I have long been struggling in that race, to what purpose all-trying time can alone determine; but if the noble lord means that mushroom popularity that is raised without merit and lost without a crime, he is much mistaken in his opinion. I defy the noble lord to point out a single action in my life, where the popularity of the times ever had the smallest influence on my determinations. I thank God, I have a more permanent and steady rule for my conduct—the dictates of my own heart. Those that have foregone that pleasing adviser, and given up their minds to be the slaves of every popular impulse, I sincerely pity; I pity them still more, if their vanity leads them to mistake the shouts of a mob for the trumpet of fame. Experience might inform them, that many, who have been saluted with the huzzas of a crowd one day, have received their execrations the next; and many who, by the popularity of their times, have been held up as spotless patriots, have nevertheless appeared upon the historian's page, when truth has triumphed over delusion, the assassins of liberty. Why, then, the noble lord can think that I am ambitious of present popularity, that relic of folly and shadow of renown, I am at a loss to determine.' (*Parl. Hist.*, vol. xvi., p. 977.)

In the cases of the trials of the publishers of Junius's letter to the king, Lord Mansfield incurred much popular odium by laying down the doctrine that the fact, not the law, was what the jury had to consider. In the trial of Woodfall, Lord Mansfield, in his summing up, directed the jury, 'that the printing and sense of the paper were alone what the jury had to consider of.' (*State Trials*, vol. xx., p. 900.)

In the case of Wilkes, which occurred in the same year, Lord Mansfield remained firm to his former opinion, and in allusion to the odium which he had incurred in consequence, thus expressed himself: 'I honour the king and respect the people; but many things, acquired by the favour of either, are, in my account, not worth ambition. I wish popularity, but it is that popularity which follows, not that which is run after. It is that popularity which, sooner or later, never fails to do justice to the pursuit of noble ends by noble means. I will not do that which my conscience tells me is wrong, upon this occasion, to gain the huzzas of thousands, or the daily praise of all the papers which come from the press: I will not avoid doing what I think is right, though it should draw on me the whole artillery of libels, all that falsehood and malice can invent, or the credulity of a deluded populace can swallow. I can say with a great magistrate, upon an occasion and under circumstances not unlike, "Ego hoc animo semper fui, ut invidiam virtute partam, gloriam, haud infamiam, putarem."'

In the famous riots of 1780, Lord Mansfield's house in Bloomsbury Square was attacked and set fire to by the populace. The walls were all that were left of it. His library of books and MSS., his private papers, pictures, furniture, and other valuables were all consumed. Though the treasury, in pursuance of a vote of the House of Commons, applied for the particulars and amount of his loss, with a view to compensation, his lordship declined returning any account of his loss, lest, he said in his letter to the Treasury, 'it might seem a claim or expectation of being indemnified.'

After having presided for upwards of 32 years in the court of king's bench, he retired from his office in 1788. He died on the 20th of March, 1793, in the 89th year of his age. He left no issue. The earldom of Mansfield, which was granted to him in 1776, descended to his nephew, Viscount Stormont.

Lord Mansfield's judicial character stands high. His acute and powerful intellect enabled him to take a clear and comprehensive view of every case. The depth of his legal learning has been questioned; probably not without reason. And this want of depth, assuming it to have existed, may account for his sometimes making law instead of expounding it—a thing sometimes unavoidable in a judge; and though extremely difficult to do well, easier to do ill or indifferently than to unravel and set forth in luminous order a large and confused mass of law already existing on a given subject: which suggests the reflection, that though that judge who is the profoundest lawyer will be the most competent to make law, at least to know when it is necessary to make it, yet those judges who are the least profound lawyers, and consequently the least able to say when law needs to be made, will be the most likely to evade the difficulty of elucidating the old law by making new. This is matter of every-day experience to lawyers. Lord Mansfield's judicial legislation has been most successful in some branches of commercial law. In the law of real property he was less successful. For example, his decision in the case of *Perrin* v. *Blake*, which involved an alteration in the old established rules of law, particularly as regarded what is called the rule in Shelley's case, was reversed in the Exchequer Chamber. (Fearne's *Contingent Remainders*, p. 158; and Dougl., *Rep.*, 329 or 343 of 3rd edition, in note.)

In reviewing the character of Lord Mansfield, his principles of toleration in matters of religion, which he maintained both in parliament and on the bench, ought not to be forgotten.

(*Life of Lord Mansfield*, by Henry Roscoe, Esq., Barrister at Law, in Dr. Lardner's *Cabinet Cyclopædia.*)

MANSLAUGHTER. [MURDER.]

MANSOURA. [EGYPT.]

MANTEGNA, ANDREA, was born at Padua, in 1431. His parents were persons in humble life. It does not appear under what circumstances or at what age he became a pupil of Francesco Squaricone, who was so struck with his talents that he adopted him as his son. On Andrea marrying a daughter of Jacopo Bellini, Squaricone's competitor, the latter was offended, and censured his pupil as much as he had before praised him; but these censures, being in many instances well founded, only tended to his improvement, which was further promoted by the friendly advice of the brothers Gentile and Giovanni Bellini.

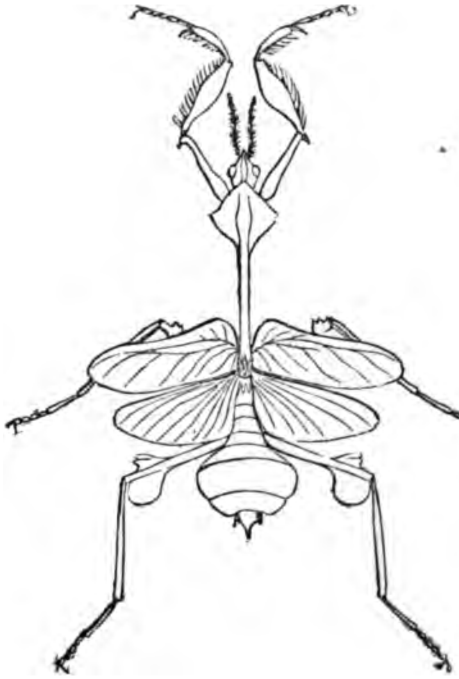
His chief residence and his school were at Mantua, where he settled under the patronage of the marquis Lodovico Gonzaga, but worked occasionally at other places, especially Rome. There are several of his oil paintings in Mantua. His master-piece, the picture Della Vittoria, which was in the Oratorio de' Padri di S. Filippo, was taken by the French and placed in the Louvre. We are not certain where it now is. M. Fuseli, who saw it in the Louvre, speaks of it in the highest terms. Few of this painter's works now remain, and most of them have been much injured. One of his greatest and most celebrated works, 'The Triumph of Julius Cæsar,' was part of the rich gallery of paintings that belonged to the Gonzaga family, which was purchased by King Charles I. for 80,000*l*. This, the greatest and most esteemed work of Mantegna, consisting of nine pictures, each 9 feet high and 9 feet wide, is now at Hampton Court. Unhappily it was coarsely painted over by Laguerre, in the time of William III. 'The Triumph of Scipio,' painted in black and white, and in admirable preservation, is in the possession of Sir George Vivyan. The earl of Pembroke has a picture by Mantegna, representing Judith with the head of Holofernes; and in the British Museum there is an admirable drawing in bistre touched with white, representing the dominion of the vices over the virtues, a counterpart to Mantegna's picture in the gallery of the Louvre (No. 1107), representing the vices expelled by the virtues. It is not probable that he painted many cabinet pictures, his time being so much occupied by large works and engraving: though not the inventor of this art, he was the first engraver of his time; the series of plates executed by his own hand exceeds fifty. Mantegna died in 1505, at the age of 74. (Pilkington and Fuseli, *Dictionary of Painters*; Waagen's *Arts and Artists in England.*)

MANTELLIA, a generic name proposed by Parkinson (*Org. Remains*) for certain alcyoniform fossils of the chalk. M. Brongniart has established the use of this word for certain cycadiform plants, to which Dr. Buckland has applied the title of Cycadeoidea. The specimens are chiefly found in the oolite of the Isle of Portland, but one (M. cylindrica) occurs in the lias of Luneville, according to M. Voltz. The stem of these plants is cylindrical or sphæroidal, and covered with transverse impressions of leaf bases. The internal structure resembles Cycas. (Buckland, in *Geol. Trans.*, 1828.)

MANTES. [SEINE ET OISE.]

MA'NTIDÆ, a family of Orthopterous insects, the species of which may be distinguished by the following characters:—Head exposed (not hidden by the thorax), furnished with three ocelli, or simple eyes, beside the ordinary pair of compound eyes; palpi short, slender, and cylindrical; antennæ generally setaceous, but sometimes pectinated; short in the females and long in the males; body elongated; the thorax usually very long, often dilated at the sides and dentate; abdomen long, and with the terminal segment small in the male sex, more or less dilated, and with this terminal segment large in the females; the apex furnished with two small appendages; legs long; the four posterior legs slender, the anterior legs with the coxæ very large and elongated; the femora also very large, dilated, and furnished with a double series of spines on the under side, between which (when the animal is in a state of repose) the tibiæ are placed: the tibiæ are rather short, armed with spines, and having a strong spine at the apex, which is recurved; tarsi usually five-jointed, but in some species the posterior tarsi have only three joints; wings horizontally folded when at rest.

The principal genera contained in this family are:—*Heteronytarsus*, *Eremiaphila*, and *Mantis*. The species of the first of these three genera are readily distinguished by there being only three joints to the posterior tarsi, there being five joints to the tarsi in all the species comprised in the remaining two genera. In the genus *Eremiaphila*, the palpi are obtusely pointed, and the head is partially enveloped in the thorax; the two posterior pairs of legs are long and slender, and the thighs are sometimes terminated by a small spine; the penultimate segment of the abdomen is furnished with two spines in the females. The elytra and wings are always very short. The genus *Mantis* (as now restricted) is distinguished from the last by the head being free, the palpi very slender and almost pointed, and the wings as long as the body, or nearly so; the penultimate segment of the abdomen is never furnished with spines.



Mantis gongylodes. (Lin.)

The Mantidæ are found in all warm countries, are exceedingly numerous, and remarkable for the grotesque forms which they usually assume. Their resemblance to a portion of a plant is often so great, that it is only by their motions they can be discovered. The names *religiosa*, *precaria sancta*, &c., have been applied to certain species on account of a peculiarity in their habits—that of erecting the thorax at an angle with the body, and placing together the large fore-legs, like the hands of a person when at prayer; in this position they will sometimes remain perfectly motionless for several hours. Their food consists of flies and other insects, which they are exceedingly dexterous in catching by means of their fore-legs; the prey is held by the fore-leg by bending back the tibia against the femur; the opposing surfaces of these two portions of the legs being covered with spines, enables them to retain their prey in this manner, and to convey it to the mouth.

The eggs are deposited by the female Mantis upon plants, and are covered by a glutinous substance, which soon becomes hard and forms a kind of case, in which they are arranged in a symmetrical manner. The form of the case varies according to the species. The young, when hatched, resemble the parents, except in size and in being destitute of wings.

Mantis gongylodes has been selected to illustrate a common form of the insects of the present family. This species inhabits the East Indies, and when alive is most probably of a green colour. The female is about four inches, and the male is about three and a half inches in length.

MANTINEIA was situated in the east part of Arcadia, in an elevated plain of considerable extent, which was bounded on the north by the plain of Orchomenus, and on the south by that of Tegea. [ARCADIA.] The inhabitants of Mantineia originally dwelt in four or five separate districts (Xen., *Hell.*, v. 2, § 7; Strabo, p. 337); but were afterwards collected into one city. The Mantineans had a democratical form of government, and were closely connected with Argos. Their political constitution, which appears to have been partly framed by Nicodromos, a friend of Diagoras of Melos, has received great praise from Polybius and Ælian. (Pol., vi., p. 487, C. (Casaubon); Æl., ii. 22, 23.) Their form of government and their connection with Argos led them to oppose the Lacedæmonian interests. In B.C. 418 they formed an alliance with Elis and Argos against Sparta, but were entirely defeated and obliged to sue for peace. (Thucyd., v. 64-74, 81.)

In B.C. 385, the Spartans, suspecting the designs of the Mantineans, commanded them to destroy the walls of their city; and on their refusing to do so, the Spartans sent an army against the place, under the command of Agesipolis. Agesipolis took Mantineia by diverting the course of the river Ophis, which flowed through the city, and thereby causing an inundation, which undermined the walls. (Xen., *Hell.*, v. 2, § 1-7; Paus., viii. 8, § 5; Diod. xv. 5.) The city was then destroyed by the Spartans, the inhabitants compelled to live apart in four hamlets, as in antient times, and the form of government changed to an aristocracy. After the battle of Leuctra, the Mantineans again rebuilt their city; and it was in the vicinity of their town that the battle was fought, B.C. 362, between the Spartans and Thebans, in which Epaminondas fell. Mantineia, in later times, joined the Achæan league; but in consequence of the massacre of a garrison of Achæans, who had been placed in the town at the request of the inhabitants, the city was attacked and taken by the Achæans in connection with Antigonus Doson, who sold all the male population as slaves. In honour of Antigonus, the name of the city was changed to Antigoneia, which it retained till the time of Hadrian, who restored its original name. (Paus., viii. 8, § 6.) Pausanias, who visited this city in the second century, describes it as a large and flourishing place, and has devoted a considerable part of his eighth book to a description of its works of art.

The ruins of Mantineia, now called *Paleopoli*, are still considerable. Colonel Leake says, 'The circuit of the walls is entire, with the exception of a space of four or five towers on the eastern side; in no place are there more than three courses of masonry existing above the ground; and this height is so uniform, that one cannot but believe that the remainder of the works was constructed in sun-baked bricks, as it appears to have been when Agesipolis, by means of the little river Ophis, which flowed through the city, made an inundation, which submerged the foundation, and effected a breach in the superstructure. The facing only of the work is constructed with large wrought stones, put together without cement; the middle being filled up with a rubble of broken stones mixed with mortar; the inner lining was 2 feet thick, the outer 4 feet, the rubble 4 feet—total 10 feet. The form of the city was slightly elliptical, and about equal to a circle of 1250 yards in diameter, or 2¼ miles in circumference. The number of towers, if I reckoned right, is 118, the curtains are generally about 80 feet long, the towers 23 feet in the face and 13 in the flanks. There are ten gates, the approach to which was carefully defended. The entire circuit of the walls is protected by a wet ditch, formed by a small stream, which flows in from the east, and, embracing the city so as to make it an island, flows westward from the opposite extremity.' (*Travels in the Morea*, i., p. 103-105.)

MA'NTOVA, DELEGAZIONE DI, a province of the Lombardo-Venetian kingdom, is bounded on the east by Verona and Rovigo, on the north by Brescia and the southern bank of the lake of Garda, on the west by Brescia and Cremona, and on the south by the duchies of Modena and Parma. The province of Mantova is entirely in the great plain of Lombardy, and forms part of the basin of the Po. It extends on both banks of that river, a part, though only a small one, lying on the south bank. The other rivers of the territory of Mantova are the Mincio and the Oglio, both affluents of the Po. The Mincio issues out of the lake of Garda at Peschiera, and for about ten miles marks the limits between Verona and Mantova, after which it flows across the territory of the latter, forms the lagoon in the midst of which stands the city of Mantua, and then enters the Po below Governolo. The length of the province from north to south is about 36 miles, and its breadth is about 32 miles: the population, in 1837, was 257,234, distributed in 17 districts, 13 of which are north of the Po, viz. Mantova, Ostiglia, Roverbella, Volta, Castiglion delle Stiviero, Castelgoffredo, Asola, Canneto, Morgaria, Borgoforte, Bozzolo, Sabbionetta, Viadana; and four south of the Po, namely, Gonzaga, Revere, Sermide, and Suzzara. There is no town of any importance except the capital.

The territory of Mantova is noted for its fertility. It contains numerous fine meadows well adapted for the grazing of cattle, which are irrigated by numerous streams and canals; vines and mulberry-trees also abound. Landed property is very valuable in this district, which labours however under two disadvantages, namely, the danger of the inundations of the Po, to prevent which the dykes and gates are kept in constant repair at a great expense, and the unwholesomeness of the air in summer.

MA'NTOVA (or MANTUA), the Town of, is on an island about five miles in circumference, in the middle of a lagoon formed by the Mincio, and is joined to the mainland by causeways, the shortest of which is about 1000 feet in length. The town and its approaches are regularly fortified, and it is considered the strongest fortress of Italy. The town is well built, with wide streets and squares, and contains many handsome structures. The principal buildings are—1. The cathedral, one of the finest in Italy, with many excellent paintings, chiefly by pupils of Giulio Romano. 2. The church of St. Andrea, raised by the architect Leon Battista Alberti, of Florence, and adorned with paintings by Giulio Romano and his pupils, and with the mausolea of several distinguished persons, the painter Mantegna, the sculptor Sperandio, the botanist Donato, the poet Cantelmi, the philosopher Pomponacio, and other illustrious Mantuans. Giulio Romano himself, who, as painter, architect, and engineer, has enriched Mantua with numerous works of art, is buried in the church of St. Barnaba, but the tombstone, with an inscription over his grave, has been obliterated in reconstructing the church. The house of Giulio Romano, built by himself, is still standing. 3. The church of Santa Barbara, rich in paintings. 4. The public library and museum: the sculpture gallery, although little noticed, is next in value to those of Rome, Florence, and Naples; the library contains 80,000 printed volumes and many MSS. 5. The ducal palace, an old, vast, irregular structure, partly rebuilt by Giulio Romano, with some good paintings, which have been much injured during the various sieges and invasions which Mantua has undergone. The portraits of the antient dukes of Mantua were bespattered with lime in 1797 by the political fanatics of that time, who testified in this manner their hatred of princes. 6. The gates and bridges of Mantua, especially the gate dei Mulini, by Giulio Romano. 7. A palace outside of the town, called 'of the T,' because some say it is built somewhat in the shape of that letter, whilst others pretend that the name is derived from the dialect word ‘tejetto,' which means a drain for the marshy waters with which the ground was encumbered. This structure was originally intended for stables for the dukes Gonzaga, but under the direction of Giulio Romano it grew into a vast palace. The same artist, with his disciples, painted the apartments, one of which is called the Hall of the Giants, and contains a representation of the defeat of that mythological race by Jupiter.

Two miles from Mantua is the village of Pictole, which a vague tradition reports to be the same as Andes, Virgil's birthplace. The dukes of Mantua had a palace here, called La Virgiliana, which still exists, though much dilapidated.

The town of Mantua contains about 25,000 inhabitants, independent of the garrison. It is a bishop's see, has a lyceum and a gymnasium. In 1833 the province contained one hundred and fifty-six elementary schools for male children, and ninety-seven for females. (Serristori, *Saggio Statistico.*) The Jews, who are several thousands in number in Mantua, have their own schools and a house of industry supported by themselves.

The origin of Mantua is lost in the obscurity of the ante-Roman times. Virgil (*Æn.*, x. 201) boasts of its Etruscan origin, its former power, and says it was inhabited by three different races; and Pliny the elder (iii. 19) observes that it was the only relic of the Transpadane Etruscans, from whom it passed into the power of the Cenomani Gauls, and afterwards became subject to Rome with the rest of Cisalpine Gaul.

After the fall of the Western empire it was successively subject to the Goths, the Longobards, the Franks, and the German emperors. In the twelfth century it asserted its freedom as an independent municipality, like the other Lombard cities, but afterwards became subject to native tyrants or usurpers. The remaining history of Mantua is given under GONZAGA.

MANTUA. [LOMBARDY; MANTOVA.]

MANU (a word which implies 'rational,' from *man* to 'understand'), according to a judicious Hindu fiction, was the son or grandson of the creating deity Brahmâ, the first of rational beings, and the progenitor of mankind, who thence are called Mânavâs, or Manujâs (offspring of Manu). To this primeval sage, the father of the human race, and consequently their patriarchal ruler and legislator, is ascribed a celebrated system of religious and civil law, which in the beginning of time was revealed to him by Brahmâ, and has been handed down by tradition to the present age. In other words, the Sanskrit work now extant, and indiscriminately called Smriti (tradition), or Mânavadharmasâstra (the Institutes of Manu), is deemed by the Hindus not only the oldest but at the same time the holiest text after the Vedas. Before these pretensions of the sacred code to antiquity and authority can be duly appreciated, it will be convenient to state its contents, and to point out the leading features of a system at once so comprehensive and so complicated that it would be almost impossible to dwell upon its particular precepts without entering fully into the labyrinth of Hindu religion and ceremonies. The work is divided into the twelve following chapters:—i., On the creation; ii., On education, or on the first order; iii., On marriage, or on the second order; iv., On economics and private morals; v., On diet, purification, and women; vi., On devotion, or on the third and fourth orders; vii., On government, or on the military class; viii., On judicature, and on law, private and criminal; ix., On the commercial and servile classes; x., On the mixed classes, and on time of distress; xi., On penance and expiation; xii., On transmigration and final beatitude.

We shall not dwell on the first or last chapter; the first is occupied with a summary of the contents of the whole code, and with a problem of cosmogony, in accordance with the wild and fanciful conceptions of Hindu metaphysics and natural philosophy; the twelfth chapter contains a detailed system of metempsychosis and final punishments, closely connected with the institutes of temporal law. It is obvious that either a strict order in the arrangement of the judicial code has been neglected, or, what is more probable, the monarchical and civil laws (vii.-xi.) have purposely been separated from the general duties contained in the first half of the work. These for the most part are of a religious character, being engrafted on the most rigid distinction of caste, and therefore totally dependent upon the hierarchical rules of the first order, by which even the minutest actions of the inferior classes are invariably to be regulated. Without entering into the mass of formalities and customs by which the main structure of the Brahminical, and in fact of every hierarchy is largely cemented, and into those generally absurd and often ridiculous ceremonies inculcated upon the different branches of society, it will be sufficient to remark that they were evidently congenial to the religious prejudices, and to the habits and disposition of the Hindus, and that most of them had long been sanctioned when the sacred code was promulgated. This is expressly asserted by the author himself, who professes to give the system of law in its full extent, and the immemorial customs of the four classes, adding that immemorial custom is transcendent law, approved in sacred scripture, and that holy sages have embraced good usages long established. The principal duties of the four classes in general are stated as follows:—

To the first, or sacerdotal order, the supreme ruler assigned the duty of reading the Veda, and of teaching it; of giving advice to kings, of sacrificing and of assisting others to sacrifice, of giving alms and of receiving gifts, of promoting justice on earth, and of procuring happiness hereafter; in short, a Brahmin must ever be intent on divine worship, devotion, austerity, and abstinence. It is only in case of need that he is allowed to support himself by tillage or traffic, but never by service for hire. Although he is by right the chief of the whole creation, and, whether learned or ignorant, must be revered as a powerful divinity, nevertheless he should constantly shun worldly honour, and rather seek disrespect and poverty.

The Kshatriya, or military class, is bound to defend the people, to read the Veda, to sacrifice and to give alms; the Vaisya caste to cultivate land, to keep herds and flocks of cattle, to carry on trade, to lend at interest, to sacrifice, to read the scriptures, and to bestow presents. The business of the fourth, or Sudra class, is only to serve the three upper orders, and chiefly the Brahmins.

Now in these four classes, which may be called the pillars of Hindu society, those only who are born of wives equal in caste are to be considered as of the same class with their fathers. But by intermixture and marriage with women who ought not to be married, and by the omission of prescribed duties, a great number of impure classes have been formed, which in their turn are obliged to perform strictly the special rules and obligations enjoined on their caste, or else they will sink to a still lower degree in the scale of human society. These mixed classes are enumerated at large in the tenth chapter, and prove a far advanced state of civilization by the very great variety of professions which they exhibit. But as even the aboriginal tribes and the inhabitants of adjacent countries are asserted to have gradually sprung from the same source, we need scarcely remark that the institution of caste carried to this extent must be altogether imaginary; and moreover that a system of law founded on these vague and fanciful principles must be a partial and almost degrading one. Hence the punishments, consisting of pecuniary fines and confiscation of property, of mutilation of the body, and death, of exile and loss of caste (which is deemed moral death), are inflicted according to the privileges of the different classes; in general these punishments are slight and trifling for the highest order, but dreadfully severe and cruel for the same crimes when committed by an individual of inferior caste. Thus a soldier who defames a priest shall be fined a hundred panas, a merchant a hundred and fifty, but a mechanic or servile man shall be whipped; and while the slaying of a Sudra by a man of the sacerdotal class is exactly equivalent to the killing of a cat or dog, the murder of a Brahmin is an inexpiable crime, and he who barely assaults a priest with intention to hurt him shall be whirled about for a century in a place of future punishment, which is described as 'a dark hell.'

With regard to the penal provisions of the criminal law we shall only observe that in most of them the principle of retaliation has been sanctioned; for instance, whoever breaks a dam or sluice, by which an inundation would be caused (Buchanan, *Mysore*, i. 4), shall be drowned; an adulterer shall be burned on an iron bed; a cut-purse is to lose two fingers, and 'with whatever limb a thief commits the offence, even that limb shall the king amputate' (viii. 334; ix. 273, ff.). Nevertheless most of the punishments may be commuted for pecuniary fines; and in case a temporal chastisement proves unavailing, threats of future pain are often held out. A priest may by muttering imprecations and holy charms chastise those who injure him, without complaining to the king. In short the first part of the sacred code is entirely what we should call hieratical. This character is apparent not only in its inflexible severity where religion and its ministers are concerned, and the well-calculated distinction of castes, by which a free intercourse between the members of society would be prevented, and consequently a more close dependence on the priesthood ensured, but also in the spirit of sublime devotion, of benevolence and tenderness to all sentient creatures, by which sacerdotal institutes are generally distinguished.

The second part of the code, containing the monarchical and civil laws, is more congenial to social order, and although the same spirit of hierarchy prevails, it is often checked by rules of a sound policy and of regular administration. The king, born in the military class, is formed of particles drawn from the substance of the guardian deities; surpassing all mortals in glory, he is himself a divinity in a human shape, and consequently he must be the protector of all classes who discharge their duty (7, 4. 9, 301 ff). 'He must invariably speak truth and never transgress the rule of strict justice; but as just punishment cannot be inflicted by an ignorant and covetous king, he has to learn the science of criminal justice and of policy, the system of logic and metaphysics and sublime theological truth from learned priests, and from the people the theory of agriculture, commerce, and other practical arts.' Nothing is so often and so strongly inculcated by Manu as the equity and justice of kings in protecting the property of their subjects against fraud and violence. For this purpose the prince shall appoint a governor of one town with its district, another of ten towns, of twenty, of a hundred, and above all these inferior authorities, a high officer, whom we may perhaps call a lord-lieutenant, over each thousand towns. Also, to prevent the people being oppressed, a superintendent of all affairs shall be established in every large town to inspect the inferior officers. A large number of laws for the mercantile tribe, with rigorous regulations about the sale and purchase of marketable things, about weights and measures, tolls and freights for boats passing up and down rivers; the severe punishment of robbers and of those who will not restore loans and deposits, and the most subtle definitions of the law of inheritance—all tend to show that, however restricted by the rules of caste the social and personal condition of an individual might be, his property at least was respected and held inviolable. As to the laws of succession, it is laid down as a fundamental rule, probably derived from antient patriarchal manners, that, if possible, the whole property of the family should be kept together. Accordingly after the death of his father, the eldest son may take entire possession of the patrimony, and the others may live under him, unless they choose to separate. In this case, the widow and such persons as by crimes or mental and corporal defects are legally excluded from participation, being provided for, the heritage is divided into portions according to the minute and almost endless variety of regulations by which, owing to the real or imaginary intermarriage and mixture of classes, this part of Hindu law has become extremely abstruse and intricate. Property belonging to a sacerdotal student and to a minor must be guarded by the king, until the owner shall have concluded his studentship, or until his infancy shall have ceased in his sixteenth year. No tax is levied or charge made for this trusteeship nor for any tuition whatsoever; and except custom-duties and market-taxes, the only legal tax or annual revenue which a sovereign may receive from his whole dominion through his collectors is imposed on the mercantile and agricultural classes. He may take either a twelfth part of the crops, or an eighth, and in time of distress even a fourth part, but in every respect he must act like a father to his people. (7, 80, 10, 118 ff.) Serving men, artisans, and mechanics never pay taxes, but they must occasionally assist by their labour when needed. According to a theory most rigorously supported in a rude state of feudal and despotic government, by several Hindu lawgivers of modern times, and even by a passage in Strabo, the king has been declared sole possessor of the soil (*Digest of Hindu Law*, 1, 460; Strabo, p. 1030, *ἔστι δὲ ἡ χώρα βασιλικὴ πᾶσα*). But although the sovereign's right to an annual ground-rent, and his gifts of land, so often recorded in inscriptions and written documents, may originally have been founded on such a doctrine, its practical application would have proved ineffectual, and in fact it is nowhere adopted nor even mentioned by the sacred code. On the contrary, it is expressly stated as a rule laid down by antient sages, that cultivated land shall be the property of him who has cut away the wood, or who has cleared and tilled it (9, 44). To prove the inviolability of the tenure of land, in which the proprietor is rather protected than limited by government, many special laws might be produced, such as those concerning landmarks and boundaries, the common ponds by which the fields are watered, the punishment inflicted on herdsmen and owners for injuring cattle; and so far is the agricultural tenant from being disturbed in his possession, that even if land be injured by his neglect, he shall only be punished by a heavier tax.

The most striking feature by which, on the whole and notwithstanding its many glaring defects, this code is distinguished, is the rigour and purity of its morals. A complete system of ethics might be gathered from the scattered moral sentences, of which we subjoin the following few examples. 'Let not a man be querulous, even though in pain; let him not injure another in deed or in thought, let him not even utter a word by which his fellow-creature may suffer uneasiness (2, 161). Let him bear a reproachful speech with patience; let him speak reproachfully to no man; with an angry man let him not in return be angry; abused, let him speak mildly (6, 47). Let him say what is true, but let him say what is pleasing; let him speak no disagreeable truth, nor let him speak agreeable falsehood (4, 138 ff.). Though oppressed by penury, in consequence of his righteous dealings, let him never give his mind to unrighteousness (4, 171); let him be firm in his contentment and check all desire of acquiring more than he possesses, for happiness has its root in content, and discontent is the root of misery (4, 12). A wise man should constantly discharge all the moral duties, though he perform not constantly the ceremonies of religion (4, 204); he should act without any view of reward, and constantly shun religious hypocrisy, for he who describes himself to worthy men in a manner contrary to truth is the most sinful wretch in the world; he is the worst of thieves, a stealer of minds (4, 255). Even here below an unjust man attains no felicity, nor he whose wealth proceeds from giving false evidence; for the soul itself is its own witness: offend not thy soul, the supreme internal witness of men. The sinful have said in their hearts, "No one sees us." Yes, the gods distinctly see them, and so does the spirit within their breasts (4, 170, 8, 84). He who perseveres in good actions, in subduing his passions, in bestowing gifts, in gentleness of manners, who bears hardships patiently, who associates not with the malignant, who gives pain to no sentient being, obtains final beatitude (4, 246; 12, 10). Single is each man born, single he dies, single he receives the reward of his good, and single the punishment of his evil deeds. When he leaves his corpse, like a log or lump of clay on the ground, his kindred retire with averted faces, but his virtue accompanies his soul' (4, 240). The principal moral duties in general are summed up in the following passage: 'The avoiding of all injury to animated beings, veracity, the abstaining from theft and from unjust seizure of property, cleanliness and command over the bodily organs, form the compendious system of duty, which Manu has ordained for the four classes' (10, 63). To conclude with the words of Sir William Jones: 'The work contains abundance of curious matter, extremely interesting both to speculative lawyers and antiquaries, with many beauties which need not to be pointed out, and with many blemishes which cannot be justified or palliated; it is a system of despotism and priestcraft, both indeed limited by law, but artfully conspiring to give mutual support.'

The time at which the laws of Manu were composed is wholly uncertain, and it was only from conjecture that the eminent Sanskrit scholar whom we have just named fixed the twelfth century B.C. as the probable epoch of their composition. Generally speaking we may safely pronounce it the code of an already refined and enlightened people, and the work itself bears ample testimony that a very advanced degree of civilization had been acquired by the Hindus when these laws were promulgated. For producing every article of luxury an immense variety of professions would be required. And as a Sudra deciding causes of law, and even a Sudra-king, are mentioned (4, 61; 8, 21), and as king Vena is censured for having given rise to a confusion of classes (9, 66), it would seem that the order of things was then nearly the same as in modern times, in which, according to the remark of a judicious observer, 'every profession, with few exceptions, is open to every description of persons, and the discouragement arising from religious prejudices is not greater than what exists in Great Britain from the effects of municipal and corporation laws.' (Colebrooke, *Remarks on the Husbandry and Internal Commerce of Bengal*, Lond. 1806, p. 174; Rickards's *India, or Facts submitted to Illustrate the Character and Condition of the Native Inhabitants*, London, 1828.) Even intellectual culture is found to have made considerable progress: the Vedas are written, and must be read, with accents and letters well pronounced; heretical books are mentioned (2, 11), legal questions must be decided by arguments and rules drawn from local usages and from *written* codes (8, 3), and written edicts of kings were by their frequency liable to forgery (9, 232). But after all, and what is most important, the burning of widows is totally unknown: on the contrary, a widow is legally bound to devote herself to pious austerity, and may even be lawfully married to the brother of her deceased husband, as she could marry any other man during the reign of king Vena (3, 173; 5, 157). Now the duties of a Satti, so minutely detailed in works of later date, could not possibly be omitted in a sacred code of law, and therefore the work seems at least anterior to the invasion of India by the Macedonians, who were fully acquainted with these *horrid* sacrifices.

The learned Hindus agree that many laws enacted by Manu were confined to the first three ages of the world, and have no force in the present age; some of them have been abolished or modified by subsequent Hindu lawgivers, according to whom the work is rather to be honoured than to be strictly followed. In fact for a long time it has formed only a very small part of the juridical system, and may be considered as the oldest text-book of law extant, or as the Hindu 'Institutes,' preparatory to the copious 'Digests,' 'Pandects,' and other legal works now in use among the different juridical schools in India. (Ellis, in *Madras Transactions*, vol i., and Sir Thomas Strange, *Hindu Law, principally with reference to such portions of it as concern the Administration of Justice in the King's Courts in India*, Lond. 1830.)

The 'Institutes' of Hindu law, or the 'Ordinances of Manu,' were verbally translated from the original by Sir William Jones, 1794. The Sanskrit text with the gloss of Kullûkabhatta was published at Calcutta in 1813, and a new edition of the metrical text, together with Sir William Jones's translation, carefully collated with the original, was prepared by Sir Graves Haughton, 1822, 1825. Another valuable edition, with select notes and a French interpretation, by Loiseleur des Longchamps, was published at Strasburg in 1830.

MANUCODIA'TA. [Birds of Paradise, vol. iv., p. 420.]

MANUEL, NICLAUS, who claims notice not only as an artist, but as a poet and author, and one who took an active part in the Reformation in Switzerland, was born at Bern in 1484. His real name is conjectured by his recent biographer, Dr. Grüneisen, to have been Alleman, but as he was illegitimate, it was, for family reasons, changed anagrammatically into that of Manuel. It is further conjectured that he was brought up by his maternal grandfather, Thüring Frickart. Having made choice of painting as a profession, he studied the art at Colmar, under the successors of the celebrated Martin Schön, until the fame of Titian attracted him to Venice, where he became one of his pupils. This period is fixed by his biographer about the year 1511, at which time he was married. He is said to have assisted Holbein, in 1515, in his 'Dance of Death;' yet this is very questionable, because he was himself employed at that time in painting the same subject at Bern, which he executed in fresco in the cloister of the Dominicans. He also ornamented his own house with a large fresco, representing Solomon worshipping idols. But of these and several other of his works nothing now remains except some small water-colour copies preserved in the library at Basle. It seems however that his pencil did not bring him sufficient for the maintenance of his family, on which account he resolved to try to advance himself in military and public affairs. He served, as quarter-master or commissary, among the Swiss allies who assisted Francis I. in his expedition against Milan, 1522, and was present both at the storming of Novara and the battle of Bicocca. In the following year he was chosen landvogt of Erlach; and from the year 1526 distinguished himself by his zeal in the cause of the Reformation. From this period he was entirely devoted to that cause, and to his various public employments. He died in 1530, when only 46 years of age.

As a writer he began to distinguish himself in 1509, by various popular poems and songs in the Swiss dialect, full of humour and sharp satire. His 'Fastnachtspiele,' or Dramatic Moralities and Mysteries, which he began to compose about 1522, are marked by the same qualities, in which, as may be almost taken for granted, his polemical pieces in support of the Reformation were not at all deficient.

MANUEL, FRANCISCO, one of the most eminent of the modern poets of Portugal, was born at Lisbon in 1734. His first study was music, but he afterwards devoted himself entirely to literature, and more especially to poetry, his talent for which obtained him many admirers, and also some enemies and persecutors. His enemies accused him not only of entertaining exceedingly heretical opinions, but of openly professing his contempt for the church, alleging against him his arguments in favour of toleration, his free remarks on the monks, and, not least of all, his translation of Molière's 'Tartuffe.' Being summoned to appear before the Inquisition, instead of obeying the mandate of the Holy Office, he attacked and disarmed the agent sent to apprehend him, and saved himself by immediate flight to Paris, in 1788; in which city he resided till February 25, 1819, when he died at the age of eighty-four.

Though a zealous cultivator of the purest models of Portuguese literature and poetry, Manuel was a no less ardent admirer of the classics. His veneration for the writers of antiquity was in some degree injurious, inasmuch as it led him to regard them rather as models invariably to be followed, than as studies upon which a sound poetical taste is to be formed. And to this predilection for the poets of antiquity is to be ascribed his dislike to rhyme. Nevertheless his merits and excellencies are undeniable; and it has been said of him that no Portuguese poet or writer since the time of Camoens did so much for the language, in which respect his services were more valuable than those of a whole academy. He excelled in lyric and satiric poetry, and among his productions of the former class his odes to D'Albuquerque and Washington are deservedly admired for their sublimity and grandeur. Many of his epistles, tales, and fables are also stamped by merit, though of a different kind. The services which he further performed for Portuguese literature were very considerable, for he produced admirable versions of Wieland's 'Oberon,' 'Silius Italicus,' Châteaubriand's 'Martyrs,' and La Fontaine's 'Fables.' Like his original compositions, these translations are distinguished by singular purity of style, carried occasionally perhaps rather too far, as his horror of Gallicisms and new-coined expressions frequently led him to adopt obsolete words, which carry with them something like an appearance of pedantry and affectation.

MANUMISSION. [LIBERTINUS; SLAVE.]

MANURE. Every substance which has been used to improve the natural soil, or to restore to it the fertility which is diminished by the crops annually carried away, has been included in the name of manure. Thus chalk, marl, clay, and even sand, when added to the soil for the purpose of improving its texture, have been called manures; and some confusion has arisen in our ideas in consequence of applying the same word to signify things which are essentially different. The French have a term by which they distinguish the substances which merely improve the mechanical texture of the soil from those which act more directly in nourishing the plants which grow in it. The former of these they call *amendements*, and the latter *engrais*. For want of another word there might be no impropriety in adopting the first of these, instead of the vaguer term of 'improving manures,' retaining the word 'manures' for those which are considered as stimulating or nourishing, and which are usually called enriching manures.

It is well known to all practical agriculturists that the texture of the soil and the proportions of the earths of which it is composed are the first and most important conditions of its productive powers. Where there is a good natural loam which retains moisture without becoming wet or overcharged with it, and permits the influence of the atmospheric air to pervade it, the crops cannot fail to be more certain and remunerating than in loose sands or tenacious clays, however rich they may be in those substances which are supposed to supply the elements from which the juices of plants are chiefly composed. But at the same time it is equally true, that the best texture of soil will not produce good crops for any length of time, without the help of dung or other rich manures to recruit the loss produced by vegetation.

The various means of improving the texture, such as tillage and the mixture of earths, are treated of separately. [LOAM; MARL; SOIL; TILLAGE.] We shall here confine our observations to that class of manures which stimulate or enrich the soil.

There are some substances which evidently belong to both classes of manure. Of these lime, either in its caustic state of quick-lime, or its milder form of a carbonate or chalk, is the principal. Lime, being an earth less porous than sand, and more so than clay, has an improving effect on soils in which either sand or clay prevails; but it has also a chemical effect as an alkaline earth, and, considered in this light, it acts on the soil in a peculiar manner, and greatly assists the effect of enriching manures, which are all of animal or vegetable origin.

Lime as a manure acts most powerfully in its caustic state, that is, when deprived of the carbonic acid which is generally united with it. The carbonic acid is expelled by the heat of a furnace or kiln, and limestone or marble is by this means reduced to the state of quick-lime. The water of crystallization, which makes the particles of marble or limestone adhere in a solid form, is driven out by the heat which reduces it to a light porous stone, very readily pulverized, and having so strong an attraction for moisture and carbonic acid, that, if it be left exposed to the atmosphere for any length of time, it absorbs both from it, and gradually returns to the state of hydrate and carbonate, or lime united with water and carbon, with this difference, that it is now a fine impalpable powder, instead of a hard stone.

Lime newly burnt has a peculiar effect upon all organic matter, which it burns or dissolves by taking from it a portion of the water and of the carbonic acid which it contains. On humus, which is the result of animal and vegetable decay in the earth, it has a peculiar effect, rendering it soluble in water, and thus fit to enter the minute fibres of the roots of plants. This circumstance is probably the secret of all the wonderful effects of lime on certain soils, while it appears almost inactive in others. In some places, where the soil is peculiarly poor, being evidently a pure silicious sand washed by the sea or by rivers, lime is found to do no good; but on the rich alluvial clays, which contain much organic matter, it is the best of manures, both in a caustic and mild state.

Caustic lime readily unites with the half-decomposed fibres of vegetable matter, such as straw, heath, and the like; it helps their decomposition and accelerates it; by its means the dead fibres of the roots of vegetables, which remain in the earth when the plant is removed, become soluble; and their elements, entering into new combinations, supply the materials for the various vegetable substances which are naturally produced. As long as there is a store of organic matter or humus in the soil, lime will be an excellent manure; as soon as this is exhausted, it will only add to the sterility by destroying every fibre which the seed might throw out from its own substance by the assistance of light and moisture. This will account for the various reports which have been made at different times of the effect of lime when put on land. In some instances the quantity which might be safely used appeared almost unlimited, in others a very small portion exhausted the powers of the soil.

Agricultural experiments are seldom conducted with sufficient precision. The man of science in his study operates on a minute portion of soil, and his experiments on vegetation are carried on at best in a few feet of garden-ground. The farmer is occupied with too many things to mark the minute differences which affect the results. Where lime has been found useful, and a good crop has been obtained by the abundant use of it, land is limed as often as can be done, with the same expectation of success. The same may be said of chalking and marling: if one application has done good, another, it is supposed, will be equally beneficial. On the same principle the quack doctors pretend that their medicines not only cure the diseased, but should also be taken continually by persons in health to prevent disease. The ignorant only are the dupes of these professions. Lime is a most excellent manure, and, when properly applied, most beneficial; but it may become inert, or even noxious, when applied injudiciously.

The property to which lime owes its chief power in promoting vegetation is, its combining with certain elements of decayed animal and vegetable matter, and forming a compound which is soluble in water, and which attracts carbonic acid and moisture from the atmosphere. This substance is readily taken up into the sap by the fibres of the roots, and supplies the plant with oxygen, hydrogen, and carbon, which are the elements of all vegetable substances, if we except a few which also contain nitrogen, one of the component elements of the atmosphere. Thus we see that air, water, and carbonic acid are sufficient to afford all the elements of vegetables, and that the use of the lime is chiefly to facilitate the absorption of these elements, besides depositing a very minute portion of the pure earth in certain parts of the vegetable. Thus far lime acts as a solvent, in the same manner as alkaline salts, which, in a much smaller quantity, would have the same effect. The alkalies are seldom used as manure in a pure state, but they abound in ashes, sea-weeds, and all woody fibres of vegetables; and when these are used as manures, the alkali produces its effect. Lime, being so much more abundant, and obtained at comparatively little cost, is preferred. But lime, besides its effect on the humus in the soil, acts also on the clay which it may contain; and where this is abundant, its effect is most beneficial. For this purpose it need not be in a caustic state; and chalk, which can be used in much greater quantity, from its abundance in many parts of England, effects a much more permanent improvement in the soil. But chalk acts also chemically wherever acids exist in too great abundance, whether they be mineral or vegetable: it neutralizes these acids, and in doing so generally gives out some of the carbonic acid which it is combined with: and this, before it is quite expanded into gas, is readily taken up by the moisture in the soil and carried into the vessels of the plants, where it deposits the carbon, letting the oxygen escape by the pores of the bark and leaves.

Where limestone is abundant, and the burning of it is expensive, it is sometimes broken and pounded fine: in this state it is of great use in stiff soils. At first it acts merely mechanically, as fine sand would do; but gradually pulverising and meeting with acids, its chemical effects become apparent.

The use of quick-lime in rendering inert vegetable fibres soluble, and hastening the decomposition of animal substances, is of the greatest importance in agriculture. Substances may be rendered highly enriching in a short time, which, without it, would have lain long dormant in the soil or the dung-heap. Its effects in this way will be more particularly noticed when we treat of composts.

Wherever there is peaty matter in the soil, which, owing to the tannin principle which it contains, is, by itself, perfectly incapable of putrefaction, lime is the true remedy. Assisted by fæculent matter to produce a degree of heat and fermentation in it, lime soon dissolves peat and converts it into real humus, than which there is no better food for vegetation. The ashes of burnt peat act in a different way; they contain alkaline salts and earths in a state of minute division. They do not furnish any substance from which a plant derives its chief increase in bulk, but they serve to prepare other substances in the earth and convert them into manure. They have also some effect in stimulating the action of the vessels which elaborate the different juices, as culinary salt has on the stomach of most animals. At least there is every reason to think so from analogy in the absence of positive proof. From all this the practical use of lime, chalk, or ashes is readily deduced. In a very stiff clay, chalk or lime will render it much more porous, and admit the influence of the atmosphere; it will correct acidity and assist the nutritious effects of animal and vegetable manures. Quick-lime spread on a soil abounding in vegetable matter will make it active by dissolving the half-decomposed fibres and converting them into a soluble mucilage: being extremely minutely divided by its property of attracting moisture rapidly, a very small quantity produces an immediate effect. Hence it is generally spread over fallows or clover-leys, which are preparing for wheat-sowing. If it were put on the land long before the seed is sown, it would have lost its chief power by attracting carbonic acid and returning to the state of carbonate or chalk, and all the expense of burning would be thrown away, except as far as it has thoroughly pulverised it. But frost does this with chalk spread before winter at a much cheaper rate; and a good dressing with chalk will last in the soil, and its effects be preserved, many years after all the lime would have disappeared. It is therefore a matter of mere experiment and calculation whether it be more profitable to put ten waggon-loads of chalk on an acre of stiff clay, or one or two waggon-loads of quick-lime. If the soil be very tenacious, the chalk will probably be the most profitable in the end as well as the cheapest; but for a few crops the lime may appear to have the advantage. Everything depends on situation, and the comparative facility with which lime and chalk can be procured.

On poor sands chalk will be found to produce a greater and more permanent improvement than the same value in lime, which, unless it be mixed with clay or vegetable substances, will not be of great use on such soils. When marl can be procured, or clay and chalk, these will be the best correctives for the porous nature of sand, whether mixed by nature or artificially. But marls are chiefly amendments, and as such will be noticed separately. [MARL.]

The substances which have generally been used as manures are numerous and various, and have been divided into stimulating and nourishing manures. All saline substances are ranked under the first, and all organic matter under the second.

When ignorance sheltered itself under vague terms, the fertility of the soil was attributed to the general term 'salt' or 'nitre,' both very undefined substances, which led to errors instead of promoting the investigation of truth by observation. Nitre was supposed to exist in dews, rains, and snow. All vegetables were supposed to consist of salt and earth, or more properly of soluble and insoluble substances, and on this uncertain foundation theories were built and practices recommended. It was said that when the soil was fallowed it imbibed nitre from the atmosphere, because it was known that animal and vegetable matters decomposing in a heap of earth gradually produced nitre, which, although it did not actually absorb it from the air, was certainly generated by combining the elements of atmospheric air with the alkali which existed in the organic matter; and, as the earth from which the nitre was extracted was an excellent manure, from the remaining portion of organic matter in it, it was supposed to be the effect of the nitre which remained. That nitre may be of use in some cases we will not deny; but there is not the slightest foundation for believing that it is the real pabulum of plants, or that the soil owes its fertility entirely to its presence.

From the most accurate analysis of the component parts of plants, it is ascertained that salts and earths form a very inconsiderable portion of their substance, and that carbon and water furnish by far the greatest part. The nitrogen of the atmosphere is found only in some of them, and all metallic substances seem entirely adventitious.

It has been supposed that all the carbon in plants might be supplied by the atmosphere, but this is not supported by any proof; on the contrary, plants will not thrive, unless there be in the soil in which they grow substances which contain carbon, that is, chiefly animal and vegetable substances, and chalk. The two first readily part with it, but the latter retains it too strongly to lead us to conclude that the plants draw any of it from this source, unless where a stronger acid is present to release the carbonic acid by its greater affinity to lime. We may conclude then, that from whatever source the oxygen and hydrogen of vegetable substances are derived, the carbon comes from the decomposition of organic substances, either animal or vegetable, and that these, in a certain state of decomposition, afford the supply of carbon by which the plant increases and secretes its juices. As in the animal digestion the chemical affinities, as observed in the raw materials, seem all to be set at defiance, or greatly modified by a vital energy of that organ, so in the conversion of the simple vegetable sap, differing but little from pure water, into the various substances which are produced by vegetation, no analogy can be drawn from the experiments of the laboratory. Nature alone has the secret of transmutation, and it is only by watching her operations and endeavouring to imitate them, that we can hope to come to useful practical results.

These preliminary observations are necessary to the consideration of the comparative importance of various substances used as manures.

The first and most important class of manures are the excrements of animals. The peculiar property of earth in absorbing putrid effluvia and removing disagreeable smells, appears an indication of nature to lead us to bury putrid animal substances, of which the excrements and dead carcasses of animals are the most numerous and obvious. It would require no length of experience to show that wherever this is done vegetation is more vigorous. There is therefore another motive for burying dung than merely to get rid of a disagreeable substance. From the most antient times of which there are any records, the dunging of a field has been an important part of cultivation. The preparing of the dung of animals, so as to render it more efficacious, is a later improvement, and has not yet attained the perfection of which it is capable, unless it be so in China, of which we read wonderful accounts. The fresh dung dropped on the ground, far from improving the herbage where it has fallen, appears to injure it, and render it unfit for cattle to eat; when it gradually disappears, and not till then, the spot is restored to its former verdure. But if the dung is dug into the ground and covered with earth, the fertilising effect will be immediately perceived. This is a sufficient lesson to the husbandman to make him bury the dung as soon as possible. But this not being always practicable, it is collected in heaps until it can be carried to the land prepared for its reception by ploughing or digging. By mixing the straw, which has served as litter to cattle, with their dung, the quantity is increased, and by allowing this mixture to heat and putrefy, a greater quantity of manure is produced. This is probably the history of the dunghill. Science has seldom been applied to show the most profitable mode of collecting dung and forming a dunghill; but experience has, in many countries, taught methods which accord well with what science might have taught. The manure must be soluble before it can be effective; this solubility can only be produced in the more solid portions, such as the straw, by putrefaction, which the dung promotes when duly moistened. All well-managed dunghills are therefore watered in dry weather, and turned over to let every portion undergo the same degree of putrefaction. The exact moment when it is most advantageous to bury it in the ground seems not yet fully decided. Some let the decomposition go on until a great portion of the heap is converted into a black, tough, oily substance, which, from early association, gives the idea of richness. It is no doubt a powerful manure which acts speedily, but is it the most economical? This may be disputed. A great portion of the substance must have been resolved into gases, which fly off and are lost. The remainder, evidently carbonaceous from its colour, has acquired too much of the appearance of charcoal to be very efficient; and it is only the exuding juice which is immediately fertilising. The most experienced farmers agree, that whenever the brown colour of a dungheap verges towards a black, the dung has lost something of its value, besides the diminution in its bulk by dissipation. The best state in which dung can be carried to the land is, according to the best informed practical agriculturists, when the straw is so rotten that it readily breaks into short pieces, without having entirely lost its form: it should then be of a brown or mahogany colour, uniform throughout the mass. Whenever dung is mentioned by foreign agricultural writers, it is generally understood to be in this state, which in English is called short dung.

As manure is wanted for the land at different seasons, it is of consequence that the dung from the yards and stables should be collected in such heaps, and managed so as to be in the exact state which is thought most advantageous at the time when it is carted on the land. To effect this some attention is required. The oldest portion must have its putrefaction retarded, and the newest accelerated, to bring them both to the same state. This is easily done. If a certain thickness of dung is kept trodden down by the cattle, it will be a long time before it decomposes, nor will it do this without being turned over to expose the under portions to the air. If, on the contrary, it be carried out into a heap in a loose state, and occasionally turned over and moistened when it appears dry, it will heat and be ready in a very short time. When a sufficient quantity of short dung can be carried to a field prepared to receive it, and immediately ploughed in with a shallow furrow, it will soon incorporate with the soil, and afford a succession of soluble humus or mucilage, which will give regular nourishment to the plants. This is said on the supposition that the soil is in that state when it only requires recruiting, and has a texture favourable to the crops raised upon it. In poor sands or wet clays some modification in the state of the dung may be necessary.

In speaking of dung, we have not said anything of the different kinds of dung produced from different domestic animals. In some cases it may be advantageous to keep these separate; for instance, the dung of cows from that of horses, of cattle feeding on oil-cakes or grain, with or without turnips, and those fed on straw or refuse hay only. Cow-dung, when in a fresh state, is thought best for light soils, and horse-dung for cold heavy soils. The richer the dung, from the nature of the food given to the animals, the less of it need be used, and this may be worth attending to. But in general a mixture of the dung of all the different animals kept on a farm with all the straw that can be afforded, will give a manure of an average strength, which may be used upon all kinds of land; with this difference, that for light soils it should be more decomposed than for the heavy, and also ploughed in deeper; for the air penetrates the light soil to a greater depth, and sooner acts on the manure. In heavy land the straw, if not so much decomposed, will form cavities to let in the air, and allow of a more regular evaporation. All this is well known to most farmers, but not always strictly attended to. It is better to manure slightly and often than to put on a large quantity at once, except for some particular crops, which require a rich earth and consume much manure, such as potatoes, beet-root, and ruta-baga, or Swedish turnips, whatever some authors may write to the contrary, led away by the old notion that roots impoverish the soil less than seeds, which is not universally the case. Any one who has raised the above-mentioned roots with the usual manuring, and drawn them off the land to be consumed elsewhere, will acknowledge that his subsequent corn was far inferior to that which had succeeded beans, tares, or clover, with the same quantity of manure. Those who do not agree in this opinion may readily be convinced by a fair trial.

The chief use of cattle on an arable farm, besides those which are necessary for the operations of husbandry, is to produce manure for the land. If the cattle repay their food and the expense and risk attending their keep, the manure is sufficient profit. Even with a moderate loss, they must be kept, when manure cannot be purchased; and a portion of the land must be cultivated solely for the maintenance of cattle. In some poor soils one-half of the land is not too much to produce manure sufficient for the other half. The loss, if any, on the cattle must be repaid by the increase of the corn crops. Manure is to a farm what daily food is to an animal; it must be procured at any sacrifice. It is better to let land remain uncultivated in rough pasture, as was once the case with a great part of Britain, and is still the case with extensive tracts on the Continent, than to break it up without having the means of manuring it. A few crops may be obtained at first, but the land is deteriorated for ever after, and what has been obtained from it is dearly paid for.

Various means have been adopted to increase the quantity and efficacy of manure. The simplest is to increase the number of cattle, and husband their manure. It is evident that to let cattle run in loose pastures is a great loss, not only on account of the dung which is dropped, and more than lost, but also the urine, which contains the very essence of manure. In all countries where stall-feeding is practised, the lands are highly manured, and the crops more certain and abundant. With this system is connected a much more economical management of the manure, by keeping the litter and more solid parts of the dung separate from the urine and liquid parts, which are collected in large reservoirs, and used either in the liquid state, and applied immediately to the land, or in the formation of compost heaps, with earth and vegetable substances collected for the purpose, and the straw which has served for litter. As this is a subject not generally known and seldom carried into practice in Britain, we will dwell a little upon it, availing ourselves of the information obtained from other countries, particularly from the husbandry of Flanders, of which an account has been published in the Farmer's series of the 'Library of Useful Knowledge,' Nos. 105, 106, and 107.

When the urine and a considerable portion of the solid dung are washed into a reservoir immediately from the stables, its strength can be much more readily ascertained than when they are mixed up with straw and thrown into a yard. The specific gravity of the liquid is readily ascertained by an instrument, and those who are in the habit of observing this liquid manure can judge most accurately of its strength, and of the degree of putrefaction which it has undergone.

Notwithstanding some apparently contradictory opinions, it is pretty generally acknowledged by those who have had long experience of its use, that urine and similar animal substances have a more powerful effect on the soil, when they have undergone a certain degree of putrefaction, than when they are used in a fresh state, and that this is produced with the least loss of substance when the liquid has been confined in close vaulted cisterns which admit the external air only partially. On light soils this liquid has a most fertilising effect, if it is used frequently in small portions at a time. On very heavy soils this effect is not so apparent, and for such soils the liquid is accordingly mixed with sand or any light earth before it is applied; or, instead of using it at once upon the land, it is poured over the litter, which has been collected in a heap or in a yard, after having served for the cattle. This litter, having been deprived of the urine which would otherwise have mixed with it, would rot very slowly and produce a very inferior kind of manure, unless it were moistened, and fermentation were excited by pouring the half-putrefied urine over it. It may be objected that if the urine is only collected to moisten the straw which has served as litter, it would be as well to let it be mixed at first, without the trouble of pumping it up and the expense of a cistern to hold it. But we shall soon see that there is a very wide difference. In the common mode of collecting farm-yard dung, the straw is very unequally impregnated with animal matter: at one time it will contain a large portion and run rapidly into fermentation; at another, there will be so little, that it is with difficulty that heat is excited in it. By separating the urine and litter, the straw will go much further, and can be mixed with the urine at the most advantageous time; thus it forms a much richer manure in a smaller compass, from not being so much diluted with water. Should there be a deficiency of straw, earth or sand will supply its place, in as far as soaking up the rich juices; for the addition to the manure from the decomposition of the straw itself is very small in proportion to that which animal juices afford. If the liquid is collected from a stable or a yard where cattle are kept as soon as it is produced, and is carried off into a cistern, there will be a much better and drier bed left for the cattle, especially if the rain is kept off by light shades. When the litter is soiled to a certain degree, it may be removed to a heap in a proper place, where its conversion into rich dung may be effected by the addition of putrefying urine, than which nothing will so soon rot vegetable fibres, if the air be admitted to the heap. The portion which is not wanted for some time may be left to decompose more slowly; and as the time approaches when it is wanted for the land, it may be managed so as to be in that state which experience has shown to be most effective in the improvement of the crops.

There is some appearance of certainty and regularity in this mode of making a dunghill, which there scarcely is in the common practice of accumulating straw, dung, and urine without any regularity in a farm-yard, turning it over when the cattle leave it for the pastures, and carrying so many cart-loads per acre on the land to be manured, without any measure of its comparative strength. One portion is often almost burnt black, and another appears like the fresh litter of the stables, not being even thoroughly soaked with moisture. It is true that good farmers pay more attention to their dung-heaps, and endeavour to carry out the manure in a proper state; but how much more readily would this be accomplished by the help of a large cistern full of the richest animal matter in a state of partial putrefaction. In those situations where straw bears a high price, it may be doubtful whether a cistern might not permit a considerable profit to be made by the sale of a portion of the straw, without any diminution of the manure required for the farm, since for light soils the liquid might be used alone, and for stiffer soils it might be mixed into a compost with earth, chalk, and any kind of refuse vegetable matter of less value than straw. It was an opinion expressed by a celebrated agriculturist* to the writer of this article, that he considered the use of straw in dung to be merely as a sponge to hold the liquid animal matter in its pores or tubes. In fact, straw or old thatch merely rotten by long exposure to air and moisture is of little or no value as a manure, although it will sometimes produce good potatoes, by rendering a stiff soil pervious and porous; but, in a light soil, a gallon of urine is worth ten times its weight of rotten straw. This doctrine may appear strange to some agriculturists, but it will bear the test of experiment.

The great use of liquid manure on light soils is to impregnate them with soluble matter, which, being diffused through their substance, supplies nourishment to the roots of plants, wherever they may shoot out. It may be applied to the land at any time before the seed is sown, and soon after, when the blade springs up or the seed begins to form; in short, whenever the plant requires fresh nourishment, or when that which existed in the soil is diminished. Without liquid manure, the poor silicious sands of Flanders could never be cultivated, much less produce crops which vie in quantity and quality with those on the best soils. The quantity of farm-yard dung, in a very rotten state, which this soil would require according to the common system of manuring, could never be produced by all the straw which can be raised upon it in its first state of cultivation. But cattle produce urine, and this produces roots for cattle. The great effect of liquid manure has set the farmers on finding some artificial substitute for the simple urine and diluted dung of cattle. Such substitutes are obtained by mixing all kinds of refuse animal matter with water, and inducing putrefaction. The emptyings of privies from towns is scarcely a substitute; for it is the same as the liquid from the stables in a more concentrated form; but the refuse of oil-mills and various manufactures, when diluted and mixed with a portion of putrid urine, soon become assimilated to it. This becomes a branch of trade in those countries where nothing will grow without manure, and is a resource where an increasing population demands the cultivation of inferior soils to supply the necessary increase of food, as well as an increase of produce from those which are naturally fertile.

The increase of manure by the formation of *composts* is well known in many parts of Britain, and by their means the land has in many districts been rendered much more productive. The fundamental principle upon which composts have been made, is that of impregnating portions of earth with those parts of the dung of cattle, which, from want of management in the common dunghills, would have been dissipated and lost; and also accelerating or retarding the decomposition of animal and vegetable substances by the addition of earths, such as chalk, marl, clay, and even sand, according to the nature of the soil on which the compost is to be used. All solid manure which is to be ploughed into the ground should contain certain parts already soluble in water, which promote vegetation: while other portions should be in a progressive state, so as to afford a succession of soluble matter by a gradual and slow decomposition. Though we have set forth the value and importance of liquid manure, and suggest the best mode of applying it, we would guard against its being supposed that solid dung may be altogether superseded by liquid. Liquid manure, however active and immediately effective, soon loses its power; whereas solid dung, well prepared and ploughed into the ground, will last for several crops. It is the judicious use of both these manures, conjointly, which has the best and most permanent effect. The dung or compost, having been ploughed in well, requires some time before it can have any direct effect on the germination of the seed or the nourishment of the plant. The liquid, on the contrary, acts from the moment it is poured on the surface. It is the milk of the young plant, which thrives upon it and stretches out its fibres through the earth, till it reaches the dung, which, having undergone that slow transmutation which forms humus, is now in a proper state to supply the more vigorous roots with sufficient nourishment. It is evident that the growth must be more rapid and regular, and not so liable to be checked from want of proper nourishment, nor are the young roots in danger of perishing by being too soon exposed to the immediate contact of rank dung. Every exertion should therefore be made by the industrious husbandman to increase the quantity and improve the quality of every species of manure both solid and liquid: and here careful experiment can alone be depended upon. Sir Humphry Davy, who so much enlarged the sphere of chemical science by his discoveries, hastily asserted that the dung from the stables and yards should be buried in the soil as soon as possible, because when it is collected in a dunghill a great portion of volatile and gaseous matter escapes into the atmosphere. But he did not proceed to show whether the ammonia or hydrogen which escapes would have been of any use in the soil; perhaps this exhalation, instead of diminishing the value, or even the bulk of the manure, actually improved it. It does not appear that fermenting dung produces carbonic acid, for a man may sleep on hot dung without much danger, which would not be the case if much carbonic acid were evolved; the ammonia is produced in the very first stage of decomposition, as may be perceived in opening the door of a stable where horses have been shut up for some time; but a heap of manure does not produce the same effect when its first heat is gone off. Most observant practical farmers have followed a contrary practice, and let their dung be tolerably short and rotten before it is ploughed into the soil. The Flemings pour liquid manure on the small heaps of dung in the field, to excite fermentation before they spread it and plough it in; some, on the other hand, let the manure remain spread over the soil, rolling it in order to pulverise it some time before it is ploughed in. Without pretending to decide between these opposite practices, we will venture to affirm that, until more light is thrown upon the process of vegetation and decomposition, the sure experience of the farmer is more trustworthy than the most plausible theories of men of science, unless they are supported by numerous and accurately conducted experiments on a large scale.

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* Mr. De Fellenberg, of Hofwyl, near Bern, in Switzerland.

In the formation of composts the principal objects are, to regulate the decomposition of the organic substances, and to increase the bulk of the manure by means of less expensive materials than straw. For these purposes lime or chalk is generally used: the former, in its caustic state, to accelerate the decomposition of fibrous matter; the latter to add to the mass, and absorb any portion of acid, which is always produced in a certain stage of the fermentation. The mode of doing this is so generally known, that it is needless to describe it: we shall only observe that the stiffest clay may be used with advantage in composts, where better soil is not at hand; and for light lands, the stiffer the clay the better, provided it be thoroughly incorporated with the manure. The most useful material, under proper management, is peat or turf. This may be laid in layers with quick-lime and earth; the whole being well soaked with liquid manure. If any kind of vegetable matter, such as fern, broom, the tops of heath, or pond weeds, can be added, it will be so much the richer. The lime and urine, acting on the peaty matter, decompose its tannin and transform it into humus, the woody fibre is dissolved, and the whole mass, when turned over and well mixed, becomes a very rich earth, which, being spread on the land and slightly ploughed or harrowed in, greatly enriches its surface. By this means many poor soils may be improved, where the cultivation is not sufficiently extended to produce straw. Potatoes grow readily in peaty soils which are drained and limed; and the potatoes when given to cattle will produce sufficient dung and urine to improve the land without much straw being used.

As a substitute for urine, several mixtures of animal and saline matters have been tried, which are supposed to resemble it in composition. There is no reason why such a liquid might not be formed artificially, and if it can be made with cheap materials, which may be obtained in abundance and at less expense than by keeping cattle, it would be a very important discovery.

Although bones have been treated of in a separate article [Bones], it may be proper to mention here, that if some easy means of dissolving their substance were discovered, they might be made of much greater use than they now are. At present they are put in with the seed in a broken state, and as they remain a long time undecomposed in the soil, their effect, after the first crop, is scarcely perceptible, unless a very large quantity is used. By mixing dissolved bones in a liquid state with earth, almost all the component parts of urine would be there.

Experiments have been made on the subject of artificial liquid manure by Mr. Kimberley of Trotsworth farm, Surrey, and we understand the result will shortly be made public by subscription.

The various substances which are generally enumerated, as occasionally used for manure, are chiefly the refuse of manufactures, consisting of earths, salts, and organic substances. Soapers' waste is chiefly lime with a small portion of alkali. The scrapings of leather, horn, bones, and the refuse of the shambles, the hair or wool of animals, and rags made of these, may be all classed together. They must be distinguished as acting in a two-fold manner; they absorb and retain moisture, at the same time that they afford nourishment by their gradual decomposition. Hence the great effect produced by them on certain plants, such as hops, and the length of time during which this effect is perceptible, especially in dry porous soils.

It is generally supposed that animal and vegetable manures produce their effect by giving nourishment to plants out of their own substance. This is no doubt true; but it appears also that they have a power of absorption, by which they attract not only moisture but also oxygen from the atmosphere, and probably hydrogen by the decomposition of the water. Thus the elements are at liberty to form new combinations, which are assisted by the vital action of the roots. This throws no great light on the subject, but it may be kept in mind, to prevent erroneous conclusions being drawn from the result of imperfect experiments, and to put us on our guard against applying the general principles of chemistry to the composition and use of manures without carefully attending to all the circumstances and watching all the appearances. We would recommend to all practical farmers to note down every particular in the formation and application of the manures which they employ, and also their apparent effect. It will require some years to enable a man to draw just conclusions, but the data will thus be established, and more will be discovered by such a course than by all the experiments which can be made on a small scale.

There is one substance which has been highly extolled as a manure, but which is scarcely known by name in English agriculture. This is called *urate*, being a compound of urine and plaster of Paris. It is formed by mixing sand and burnt gypsum with urine, and forming a hard compound, which is afterwards reduced to powder. The Royal Society of Agriculture at Paris caused some experiments to be made with this manure for the purpose of comparing it with those which are known to be most effective, such as dried nightsoil, pigeons' dung, &c. The result was in favour of the urate for the duration of its effect on lucern in a light soil, where the portion manured with the urate produced the greatest return at the third and fourth cuttings, when the nightsoil and pigeons' dung had lost a portion of their effect. It requires a moist season to act powerfully. When mixed with dried nightsoil its effect on various crops was very great. But it does not clearly appear whether this is to be ascribed to the urate chiefly, or to the dried nightsoil. Its effect on potatoes was superior to that of the dried nightsoil. It might be worth while to repeat these experiments, which may be found detailed in the *Dictionnaire d'Agriculture Pratique*, in 2 vols. 8vo., Paris, 1828. If it should furnish a substitute for bones, it would be very valuable, as it could be obtained to an almost unlimited extent from large towns.

The ashes of vegetable substances which have been burnt in the open air contain a great portion of potass, with some fine earths. They are consequently very effective in stimulating vegetation on lands which contain a good portion of humus. They are chiefly used as a top-dressing on young clovers and grasses; and wherever there is an appearance of sourness in the grass wood-ashes are of great use. It is however seldom that wood-ashes are used as manure until the greater part of the alkali has been extracted; but when the surface of the land is pared off and the dry sods are burnt, the ashes which result from this operation are very effective in producing a good crop without any other manure. [Paring and Burning.] The refuse ashes from bleachers' and soap-boilers' premises have still some portion of alkali in them, and as they contain lime and other earths in a very divided state, their effect on the soil is very perceptible. Sea-salt has been extolled and decried at different times, owing probably to the different circumstances under which it has been tried. In a very small quantity sea-salt may have a beneficial effect on the soil. Urine contains a great deal of it, and in the formation of composts sea-water has been found to hasten the putrefaction of the animal and vegetable matters which they contained, probably by absorbing moisture, which is essential to putrefaction. Quick-lime slaked with sea-water and mixed with sand forms a mortar which attracts moisture so strongly that walls built with it are scarcely ever dry. This suggests a mode of supplying the soil with moisture, and may account for the effect of salt in particular cases.

The experiments which have hitherto been made on artificial manures have not been sufficiently varied to lead to any very accurate conclusions as to their comparative merits, and the results have not been stated with the minuteness which would make them a foundation for practical rules. There is a wide field open to the chemist and the scientific agriculturist, and many important discoveries no doubt would be the result of patient and accurate investigation.

MANURING, in horticulture, requires to be considered in a somewhat different light from that process as applied to agricultural purposes. This is necessary because of the variety of plants, possessing different constitutional habits, to which the gardener is required to turn his attention, and also because of the different results which are expected in horticulture and agriculture. In preparing the present article the writer has confined himself to simple practical facts, and has adverted only occasionally to chemical explanations. In the present state of our knowledge of that branch of inquiry, improved as it is since the time of Davy, opinions are still too vague and unsettled to afford the cultivator a satisfactory solution of the physical problems suggested by the commonest facts in the art of manuring.

The gardener is called upon to cultivate species from almost every kind of soil on the surface of the globe, intermediate between the shifting sands of the desert and the most fertile alluvial land continually enriched by the decay of vegetable and animal substances. It is therefore obvious that considerable caution is requisite in applying manure and in determining the quantity or quality suited to the respective constitutions of the various subjects which the horticulturist takes under his care. Thus, although many plants can scarcely receive too much manure, others, such as the resinous trees, are actually killed by it.

The kind of manure chiefly used, and frequently the only kind procurable by the gardener, is that derived from the farm-yard; consisting chiefly of the dung of horses or of horned-cattle, more or less mixed with litter. Formerly it was very generally the custom to take advantage of the heat resulting from the fermentation of such dung in hot-bed forcing, and there are still some objects for which this kind is found preferable [HOT-BED]; but since the hot-water system of heating has received so many improvements, the continued fermentation and consequent degree of decomposition which dung undergoes in hot-beds is rendered a less important means of obtaining artificial warmth, and consequently it becomes the more important to inquire whether manure is most beneficially applied in a state of decomposition, as some have advocated, or in a state as recent as possible, no fermentation being permitted previous to its deposition in the soil.

It is said that rotten dung contains more *humin*, weight for weight, than fresh dung. But the experiment, in order to be just, would require to be tried with two equal quantities of fresh dung, one of them being analyzed at the time, and the other after being subjected to the requisite degree of decomposition; for the latter process will of course occasion a diminution of weight, which ought to be taken into account. If the fertilising power of manure can be proved to be in proportion to the quantity of *humin* which it contains, and if the quantity of this be as great as in the more bulky form of unrotten dung, the concentrated state would certainly be preferable, in point of economy, on account of the saving in labour and carriage; but in the present state of knowledge this cannot be asserted, and until theories become reconciled with each other, and with experience, the latter must form the only safe guide in practice.

If dung contains a large proportion of litter, and particularly if the latter be in a dry state, it will be advisable to subject it in nearly all cases to a moderate degree of fermentation, assisted by a sufficient quantity of moisture, in order that the fibre of the straw may be reduced into a state permeable by the spongioles of plants, and either become sufficiently dissolved for affording nourishment itself, or serve in the first instance as an absorbent reservoir for substances of still greater solubility. Where such preparation has not been attended to, litter has been frequently observed, when turned out of the ground after a dry summer, to be still in a dry musty state, having evidently been of little benefit to the crop; and in the case of many plants, which require much manure, litter in this state would actually prove very injurious. But if the dung be what is termed short, containing little straw, and that well saturated with the liquid proceeds of the stalls, it may be dug in without fermentation for most kitchen-garden crops, provided it is well divided and properly mixed with the soil in digging or trenching in. This is necessary in all cases, but more especially so when the manure is applied fresh; for disease is often induced by the roots entering into masses constituted of particular substances which either wholly or, at all events, too powerfully predominate over the proper nutritive solutions.

But on the other hand, if the soil is of a wet and stiff nature, then long unrotted dung is most proper, because its straws form so many minute drains which, to speak technically, keep the ground open; and in such soils, by means of littery manure and drilling, a crop of potatoes, for example, can be raised very superior in quantity and quality to that obtained from the application of rotten dung. In this case the previous reduction of the fibre of the straw is not requisite; for the moisture of such soils is sufficient to effect this by degrees, and whilst the process of growth is going on. The authority of Miller may be adduced on this subject; in his 'Gardener's Dictionary,' he observes, 'In very cold moist land, I have frequently seen new horse-dung buried as it came from the stables, and always observed that the crops have succeeded better than where the ground was dressed with very rotten dung.'

On the other hand, dung that has been moderately fermented, and frequently turned over, so as to be easily cut with a spade, is the most proper for such trees as require manure, or for slow-growing crops, where the roots have to remain for years in contact with it. If the heat arising from fermentation do not exceed 100° Fahr., Sir Humphry Davy considers that but little loss will arise from the process. With regard to trees and many perennial plants, no more injury would be incurred by using fresh dung instead of rotten, for the first season, or rather whilst vegetation continued active; but after the roots become nearly dormant, canker or disease of some sort is apt to ensue. The roots may have grown luxuriantly during the summer; but when they are arrested by the approach of winter, decomposition will still be going on amongst the materials on which they feed, and these materials may perhaps be chemically changed, at all events vitiated for the purpose of nourishment, before the roots are again called to action.

These remarks relate chiefly to the description of manure which is most generally used. Other substances which are or may be successfully applied to promote the growth of vegetation are exceedingly numerous; and although it would be impossible to particularise them, they may nevertheless be made sufficiently known by stating that they consist of—

1. All animal substances without exception.
2. The excrementitious secretions of all animals.
3. All kinds of vegetable substances, in one state or another.
4. A few mineral substances, of which one of the principal is lime.

Animal substances are very powerful manures, and require to be attenuated or diluted before plants can derive nourishment from them, or in fact before either roots or tops can be safely brought within their contact. If the roots of a plant be wholly immersed in oil or in blood, that plant will be destroyed. Blood is one of those liquid manures which is occasionally supplied to plants so situated as to render bulky manure inapplicable; but it should unquestionably be copiously diluted with water. Oily manures, such as blubber for instance, which will not dilute with water, must be divided by earthy matter or other substances, by which means a large surface will be exposed to atmospheric agency. Oil is impervious to air and water; and it may be taken as a general rule, that all substances impervious to these elements are unfit for the purpose of vegetable nourishment, and must therefore be subjected to some mode of decomposition in order to render them available. Supposing a mass of oily substance equal to one cubic foot were isolated, the surface exposed to the oxygen of the air (by which soluble matter in such substances, according to Sir Humphry Davy, is produced) is 864 square inches. If however this mass be separated by any substance sufficiently porous to admit air, such as earth, the air will pervade every interstice, and the requisite decomposition will be rapidly brought about. Bones are another form of animal matter much employed, and of considerable energy, especially in calcareous soils, provided they are reduced into small fragments and fermented before being used. Gardeners often use them in that state for forcing strawberries, and, reduced to dust, as a top-dressing for lawns.

The liquid portions of excrementitious manure likewise require either to be diluted with water or to receive an admixture of soil before they are brought in contact with the roots of plants. In the case of trees with roots lying deep in the ground, such dilution is not always necessary; but, generally speaking, adherence to the rule is advisable.

Sir Humphry Davy recommends covering dead animals with five or six times their bulk of soil mixed with one part of lime. This, when mixed, it may be observed, will still form a very strong manure, and for some plants much too strong; but for such as the vine it will form a valuable compost, particularly if broken bones are mixed with it.

Manures derived from the vegetable kingdom require little preparation if they consist of such plants as are chiefly parenchymatous, such as the brassica tribe; their substance is easily soluble, and they may therefore be turned fresh into the soil. The period of their growth when this is most beneficially performed is before they run to seed. Weeds may even be used with great advantage, if properly prepared; but bad consequences may result from their seeds rendering the ground foul, and thus occasioning much expenditure of labour to extirpate them again. Seeds, it is well known, will not germinate without air; but with this, and sufficient heat and moisture, nothing can prevent them from germinating. Therefore if weeds be thrown into a heap and turned, whilst at the same time fermentation is encouraged till the heat is fully equal to that which would naturally cause the germination of the seeds, taking care that the outside be turned into the centre, no danger will arise from using such manure after the process has been continued sufficiently long for the germination of the slowest vegetating seeds which the heap may contain, because under these circumstances the young plants will be continually perishing as the heap is turned over from week to week. There are many aquatic plants that will not grow on dry ground, and a preparation similar to the above is not essential for the purpose of killing their seeds before their application to dry ground, which is not, as it were, their proper element.

Yeast is a most powerful vegetable manure, especially if employed in a state of putrefaction; but it requires to be diluted with water till it appears of the colour of very small beer. Applied in that state, it has extraordinary power in stimulating the growth of annual crops of all kinds; but its effects are by no means permanent; for lawns however it is a restorative manure of great value. The same may be said of malt-dust.

It is observed by Sir Humphry Davy that mere woody fibre seems to be the only vegetable substance that absolutely requires fermentation to render it nutritive to plants; and he instances tanners' spent bark as a substance very absorbent and retentive of moisture, yet not penetrable by the roots of plants; or it might rather have been said, not capable of affording nourishment, from the predominance of some noxious principle, which requires to be decomposed; for when this principle is broken down by fermentation, plants, as may be observed in bark-beds, root very readily in tan. This deleterious principle is the tannin which bark contains, and the reason of its noxious effects upon plants is that it precipitates the azotized matter in which roots abound, and the presence of which, in an organisable state, is indispensable to the existence of roots. (Payen, in *Ann. Sc.*, new series, iii. 18.) Inert peaty matter is a substance of the same kind, and will remain for years exposed to air and water without undergoing change. When peat becomes inert, it is in vain to attempt to grow any sort of plant in it; but nothing is more certain than that if drained of stagnant mosture and mixed with lime and dung, it will become very fertile for most crops. It often happens that peat or *bog-mould*, frequently procured at a great expense for American plants, becomes inert; in such cases, a good result would be obtained by turning out the peat and mixing it up in a heap with a quantity of leaves or fresh litter sufficient to promote a moderate degree of fermentation; then, as in the case of tan, it will afford nourishment, and will, from a state of uselessness, become valuable.

Of mineral manures, *lime* is the most useful. It is not recommended for soils that contain a large proportion of soluble vegetable matter; but it produces excellent effects in such as abound in inert vegetable fibre. Gypsum, which is found in the ashes of grasses, proves a manure for lawns.

Common salt is sometimes employed in minute portions; especially in combination with vegetable matter, in the instance of sea-weeds, in which case it is found of good quality for fruit-trees and kitchen-garden crops; but vegetable life is certainly destroyed by it, if applied in any considerable quantity. Exceptions may be noticed in the case of marine plants; the Samphire (Crithmum maritimum), for example, requires it when cultivated in inland districts; and this is also true of the vegetable inhabitants of the great salt plains of Asia. Wood-ashes, which consist principally of vegetable alkali united to carbonic acid, are a good manure, but of short duration, and they leave peaty soil in a worse state than before their application. The burning of such soil cannot therefore be too much reprehended, although strongly advocated by some who have been led away by the immediate result of one or two enormous crops. The application of dung and lime, of composts of clay, marl, scourings of ditches, &c., would render peat *permanently* fertile, more especially so when draining is judiciously attended to.

There is no considerable number of plants to which manure is prejudicial. Coniferous species of all kinds are affected most injuriously by it, and it requires to be given very sparingly to all trees which yield gum in their bark, especially stone-fruits, such as cherries, plums, peaches, and nectarines. To many however it appears to be useless; orchidaceous plants for instance, which it is now the fashion to cultivate so extensively, seem insensible to its application in any form yet thought of; and American plants in general scarcely require it, unless the peat in which they are grown be regarded as a kind of manure.

MANUSCRIPTS. [PALÆOGRAPHY.]

MANU'ZIO, ALDO, born in 1447, at Bassiano in the Papal State, studied at Rome and at Ferrara. He became intimate with Pico, count of Mirandola, and with Alberto Pio, lord of Carpi, with whose assistance he established a printing-press at Venice. The art of printing was first introduced into Italy from Germany by two Benedictine monks, called Sweinheim and Pannartz, who printed the works of Lactantius in the monastery of Subiaco in 1465. This was the first book printed in Italy. In 1469 two other Germans from Speyer established printing-presses at Venice, and soon after the art spread rapidly through Italy. The first Greek book was printed at Milan, and the first Hebrew types were used at Soncino near Cremona. Nicholas Jenson, a Frenchman, established a printing-press at Venice in 1471, which was distinguished for the elegance of its types. But Aldo Manuzio surpassed all other printers of his time in the correctness of his books. Being a man of learning as well as a printer, and having an extraordinary zeal for his profession, he procured the most correct MSS. from distant countries, and he established an academy in his house, with the view of obtaining assistance in the superintendence of his publications. Bembo and Navagero were among the members of that society. The first publications of Aldo appeared about 1490: the first with a date in 1494. In this year he published the poem of 'Hero and Leander' in Greek and Latin, and shortly after the Grammar of Lascaris, and that of Gaza, with Theocritus, and the works of Aristotle. He invented a new sort of type, which was light and resembled writing, called by the Italians 'corsivi,' and known to other nations by the name of 'Italic.' In this type he printed the Latin classics. A list of the Aldine editions was published at Padua in 1790: 'Serie delle edizioni Aldine per ordine alfabetico e cronologico;' and a still more complete catalogue has been since published at Paris by Renouard: 'Annales de l'Imprimerie des Aldes, ou Histoire des trois Manuces et de leurs editions,' 2 vols. 12mo., 1803; a second edition of which, in 3 vols., was published in 1825, and a third, much improved, in one vol. 8vo., Paris, 1834. It is said that the Greek books of Aldus are less correct than his Latin and Italian prints: but it must be recollected that his Greek books are often printed from a single MS., and that an imperfect one; a circumstance however that renders some of his Greek books very valuable at present, as being tolerably faithful transcripts of MSS. either now lost or not always accessible. These editions, especially when upon large paper, have often sold in modern times for considerable sums.

Aldo complains in several of his prefaces of the difficulties which he experienced, and the intense labour which he had to undergo in his profession, to which he devoted his whole life. He died at Venice in 1515, with the well-merited reputation of being not only an accurate printer, but a good scholar. He was the author of a Latin and Greek Grammar, a Greek and Latin Dictionary (the first of its kind), and several other works. His son Paolo Manuzio succeeded him in the direction of his printing establishment. Paolo was a man of learning, an author, and a critic. His principal works are: 1, 'Antiquitatum Romanarum liber de Legibus,' fol. 1569; 2, 'De Comitiis Romanorum;' 3, De Senatu Romano;' 4, 'De Civitate Romana;' besides notes and commentaries on Cicero's Epistles and Orations.

MAP (Latin, *mappa*, a napkin; French, *mappemonde*, a map of the world).

A map is a representation of the surface of a sphere, or a portion of a sphere on a plane. The name however is commonly applied to those plane drawings which represent the form, extent, position, and other particulars of the various countries of the earth.

Maps or delineations resembling them we may reasonably conclude were coeval with the earliest geographic knowledge, for we can scarcely conceive such knowledge to exist in a nation at all without being accompanied by some attempts at illustrations, however rude and defective, by means of linear representations on a plane surface. It is not possible indeed to fix the time of these first attempts to construct maps, but there is good reason for supposing that the Israelites were not altogether ignorant of the art; for we find Joshua commanding his selected men in the following terms: 'Ye shall therefore describe the land into seven parts, and bring the description hither to me, that I may cast lots for you here before the Lord our God.' (*Josh.*, xviii. 6.) This knowledge of the Israelites was most probably derived from the Egyptians. The geographical knowledge of the Greeks, as exhibited in the Homeric poems, comprehended only a small part of Europe, Asia, and Africa, and there is not the slightest allusion in them to any mode of delineating or representing the surface of a country. In the seventh and sixth centuries before the Christian æra, and even earlier, we know that the Greek nation was widely diffused by colonization, which, combined with their spirit for commercial enterprise, must have greatly extended their geographical knowledge. In their maritime adventures they are said to have been assisted by the nautical maps of the Phœnicians; but however this may be, we have no account of anything deserving the name of maps before those of Anaximander the Milesian, who is alleged to have been the first to construct a map of the world. There is a passage in Herodotus (iii. 136) which may perhaps indicate something like an attempt at mapping a coast. Certain Persians, being commissioned by Darius I., sailed from Sidon in Phœnicia to the coasts of Hellas, which they examined and 'registered,' or 'recorded' (ἀπεγράφοντο), till they arrived as far as Tarentum in Italy. The map of Aristagoras of Miletus is also deserving our especial attention, from its being so particularly described by Herodotus (v.), and from its likewise being among the first maps on record, at least in Greece. Aristagoras, in his interview with Cleomenes, king of Sparta, on the occasion of soliciting his assistance against the Persians, is described as appearing before Cleomenes 'with a tablet of copper in his hand, upon which was inscribed every known part of the habitable world, the seas, and the rivers.' Notwithstanding the imposing character of this description, some have thought that we should not receive it too literally; and that this map was probably nothing more than an itinerary of the country between Sardis and Susa. Itinerary maps of the places of encampment were almost indispensable to the commanders of armies; Diognetus and Beton are mentioned (Pliny, *Nat. Hist.*, vi. 17) as the surveyors of the marches of Alexander, who was very careful in examining the measures of his surveyors, and in obtaining his descriptions from the most skilful persons. The science of geography made rapid advances under Eratosthenes [ERATOSTHENES; GEOGRAPHY], who had the great merit of reducing geography to a regular system, and of founding it upon solid principles. He introduced into his map a regular parallel of latitude, which he accomplished by tracing a line over certain places whose longest day was observed to be of the same length. This parallel extended from the Strait of Gibraltar to the mountains of India, passing through the island of Rhodes; and from its central position with respect to the principal antient nations, it became a standard of reference in the maps of this period. Succeeding geographers made many attempts to determine the longitude of places by measurements of this line, but with no great success. Eratosthenes, in addition to the parallel above mentioned and other parallels, undertook to draw a meridian from Meroe through Syene to Alexandria (Strabo, ii. 114), and also to determine the earth's circumference by the actual measurement of a portion of one of its great circles. These discoveries and improvements very materially affected the dimensions of all the antient maps; and from this time the connection between astronomy and geography was so far established as to ensure an advantage to the latter by every advance of the former. This was eminently the case in the discoveries of Hipparchus, who fixed the construction of maps on a mathematical basis, and enabled the geographer to lay down his latitudes and longitudes upon certain principles.

To Strabo we are chiefly indebted for our information respecting the state of geography in the Augustan age. But the extent of the earth's surface known to this writer does not very much exceed that which was known to Herodotus four centuries earlier. His map of the world exhibits some remarkable errors. He supposed the Pyrenees to run north and south; cuts off the projecting province of Brittany from France, places Ireland not to the west but to the north of Britain, and makes the Caspian communicate with the northern ocean though Herodotus had accurately described it as a lake.

The Roman Itineraries show that their surveys were made with considerable care, although there are no traces of mathematical geography in those which have been handed down to us, the chief object in view being the clear direction of the march of their armies. All the provinces of the Roman empire had been surveyed when Ptolemy composed his system of geography, which has happily been preserved to us. It is not so much to his more perfect acquaintance with the earth that Ptolemy owes his reputation as a geographer, as to his giving solidity and unity to the science by fixing its unconnected details on a mathematical basis and carrying into full practice and to greater perfection the system of latitudes and longitudes of Hipparchus, whose invention had been much neglected for upwards of 250 years.

Ptolemy derived his information respecting the distances of places chiefly from itinerary measurements which usually exceeded the truth, and it is therefore not surprising that his map of the world should exhibit enormous errors; in addition to which consideration it cannot be supposed that he possessed real astronomical observations sufficient to determine all the latitudes and longitudes which he has given. It was not possible therefore that he should have been free from great mistakes, more especially in places beyond the Roman empire.

Some idea may be formed of the errors in his map from the circumstance of the northern coast of Africa being represented by him nearly as a straight line, the gulfs of the Great and Lesser Syrtis almost totally disappearing, and the Mediterranean being extended twenty degrees beyond its actual limits, which gross inaccuracy was continued in our maps until the middle of the seventeenth century. He also placed the mouth of the Ganges 46° to the eastward of its true position.

It seems not improbable that the maps found in the MSS. of Ptolemy are really copies of, or derived from, original maps constructed by him or under his care. [AGATHODÆMON.]

Some curious particulars have come down to us illustrative of the geographical ignorance of the middle ages, yet maps do not appear to have been uncommon even then. The maps of the middle ages may be generally classed as follows:—1st, those in which the notions of the antients were adhered to; 2nd, those which exhibited new discoveries or countries popularly believed to exist. Many maps of the first class are extant in which the old world is represented as one great island, Africa terminating to the north of the equator. Among maps of the second class are those which seem to show some important discoveries in the west of Europe and of Africa in the twelfth and thirteenth centuries.

The geography of the Arabians is but imperfectly known. Their most eminent geographer Edrisi or Eldrisi, who lived about the middle of the twelfth century, divided the world into seven climates from the equator northward, and each climate was again divided into eleven equal parts, from the western coast of Africa to the eastern coast of Asia, the inconvenience of which arrangement is very obvious.

Towards the middle of the seventeenth century several astronomers undertook to observe eclipses of the moon with a view of correcting the errors in the longitude of places. These observations however were so discordant as to lead to no satisfactory result. Galileo, by the discovery of the eclipses of the satellites of Jupiter, introduced a more certain method, which was rendered available by means of the simultaneous observations of Picard and Cassini at the observatories of Uraniburg and Paris.

Picard and De Lahire were then immediately employed in correcting the map of France, and from this period our maps have rapidly improved. The great perfection to which timekeepers have been brought, and the obvious application of these machines to the determination of the longitude, have greatly contributed to their accuracy. But notwithstanding the advanced state of our astronomical and geographical knowledge, and the science and skill displayed in our great national and other surveys, we may, with Dr. Blair, regard maps as works in progress—always unfinished, and still waiting the corrections to be supplied by the science and enterprise of succeeding ages.

Having thus briefly sketched the progress of map-making, we proceed to give a general outline of their application and construction.

On the Nature and Construction of Maps.—Maps, being plane representations of the surface of a sphere, may be obviously applied to various purposes; hence we not only have terrestrial maps to represent the surface of the earth, but celestial or astronomical maps to represent the sphere of the heavens; and these general distinctions have again their subdivisions.

There are two kinds of terrestrial maps—geographic or land maps, and hydrographic or sea maps: we shall confine our attention principally to the former; the latter, which are usually called charts, having been already described. [CHART.]

Geographic maps, as already noticed, are those which represent the forms and dimensions of the several parts of the earth, with their relative situations and the positions of the cities, mountains, rivers, &c., comprised within their limits. They may comprehend the whole earth, or one of its larger divisions, or a single district, and are called maps of the world, general maps, or particular maps accordingly. If they give the nature of the ground, the roads, buildings, &c., in detail, they become topographic maps, which, necessarily embracing a very small extent of country, are not usually referred to any spherical projection, but are represented as geometric planes, the objects in them occupying the positions severally assigned to them by the trigonometrical operations of the survey. The same distinction is made in charts of small bays and harbours. In either of these cases they are called plans.

When maps of the earth are made to illustrate any of the sciences, they are distinguished from geographic maps, properly so called, and bear their own peculiar names, as geological, or mineralogical, or botanical maps.

From the spherical form of the earth, it is obvious that the divisions and varieties of its surface may be most simply and most accurately represented by means of a globe, and in order to obtain a correct notion of its general geographic features, there is no mode of representation so satisfactory. Large globes however are expensive and inconvenient instruments, and small ones, by not admitting sufficient detail, are for most geographic purposes entirely useless. Hence we see the eminent utility of maps, notwithstanding the imperfections which necessarily accompany such a mode of representation, for a spherical surface can by no contrivance be extended into a plane without a distortion of some of its parts.

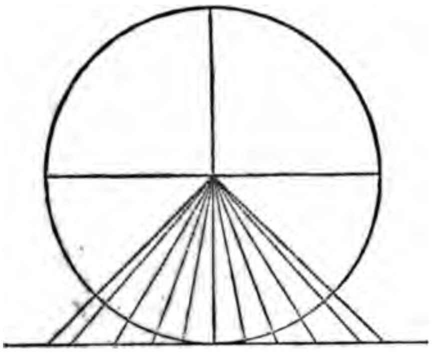
The methods adopted in the construction of maps are as various as the taste and judgment of geographers themselves, but they may all be referred to two principles, viz. *Projection* and *Development.*

By *Projection* is meant the representation of the surface of a sphere on a plane, according to the laws of perspective. By *Development* is to be understood the unfolding or spreading out of the spherical surface on a plane. This however first supposes the sphere to be converted into a cone or a cylinder—these being the forms, portions of which most resemble portions of a sphere, and which, at the same time, are susceptible of the required development.

We shall notice these two principles very briefly, as their mathematical investigation more properly belongs to the article PROJECTION.

There are four methods of spheric projection in general use, the *Gnomonic* or *Central*, the *Orthographic*, the *Stereographic*, and the *Globular*, distinguished from each other by the different positions of the projecting point in which the eye is supposed to be placed.

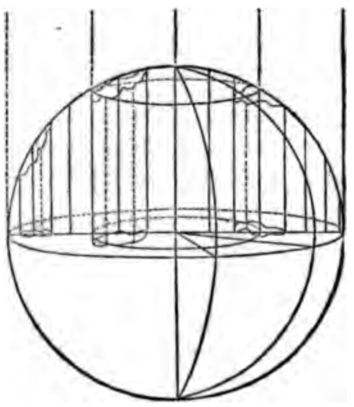
The *Gnomonic* or *Central Projection* supposes the eye to be placed in the centre of the sphere, and that the various objects to be delineated are transferred from the sphere to a plane, which is a tangent to its surface. The entire hemisphere can never be represented by this projection, since the circumference which terminates it is on a level with the eye, and is therefore parallel to the plane of projection. This method is chiefly used in dialling, but may be advantageously applied to maps of a limited extent, more especially if they are maps of the polar regions of the globe. In this case the meridians will be strait lines radiating from the centre, and the parallels of latitude concentric circles, whose distances from the centre will respectively be equal to the cotangents of their latitudes.



In the other cases of this projection, where the perspective plane is parallel to the horizon, or to any meridian, the construction is rendered troublesome on account of the parallels of latitude becoming curves of difficult delineation: these cases therefore are seldom brought into use.

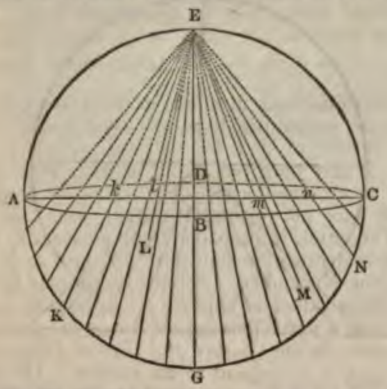
Orthographic Projection.—In this projection the eye is supposed to be at an infinite distance, so that the visual rays leave the sphere in parallel lines. The perspective plane on which a hemisphere is supposed to be delineated is the plane of that diameter which is perpendicular to the visual rays—hence every point of the hemisphere is transferred to this plane by perpendiculars let fall upon it. It will be immediately seen from the figure, that the representation will decrease in accuracy with the increase of distance from the centre; the parts near the circumference being much foreshortened and distorted.

In a *Polar map* of this projection, the meridians, as in the Gnomonic maps, will be radii, and the parallels concentric circles; these circles however will have their distance from the centre equal to the cosines, and not to the cotangents of their respective latitudes.



In an *Equatorial map*, or one in which the equatorial regions of the globe are made to occupy the cen map, the plane of projection coincides with the r of the meridians. In this case the latitude circles will be projected in strait lines parallel to the equator, which is also a strait line, and will vary in distance from it according to the sines of their respective latitudes. The meridians will be portions of ellipses intersecting the equator in points similar in position to the intersecting points of the parallels on the polar diameter, and having their transverse axes coincident with this diameter and equal to it.

Stereographic Projection.—In this projection the eye is supposed to be placed at the surface of the sphere, and to view the concave of the opposite hemisphere through the plane of that circle, in the pole of which the eye is placed.



If E be the eye, and A, G, C the hemisphere to be represented, A, B, C, D will be the plane of projection; and the position on this plane of any point of the spherical surface will be indicated by a line drawn from that point through the plane to the eye. Thus the points K, L, M, N on the sphere will be transferred to the plane at *k, l, m, n*.

The advantages offered by this method of projection have brought it more into use than the methods before mentioned. It is especially calculated for maps of the world, as usually made in two hemispheres, from the circumstance of the representation being less distorted, and also on account of the meridians and parallels intersecting each other at right angles, as they do on the globe. Its construction also is less difficult than others, since all the great circles of the sphere are either circles or strait lines in the projection. The meridian of 20° W. is the one usually selected by English geographers for the plane of projection in these maps of the world, because this meridian passes very nearly between the eastern and western continents, which therefore occupy their respective hemispheres.

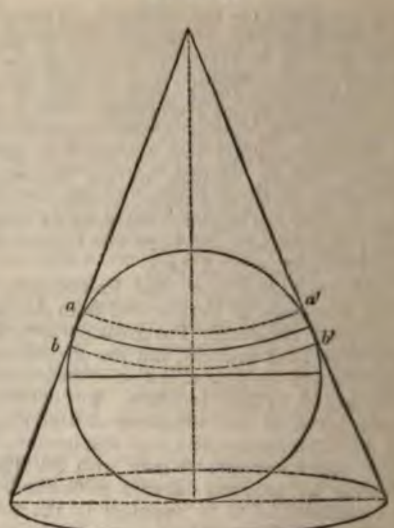
Globular Projection.—This projection which is a modification of the Stereographic, was invented by the astronomer De Lahire, who supposed the eye to be placed at a distance from the sphere equal to the sine of 45°; that is, if the diameter of the sphere be equal to 200, the distance of the eye from the nearest point of the circumference would be $70\frac{7}{10}$. Some further modification was subsequently deemed desirable, in order that the meridians might intersect the equator at equal distances. This condition is very nearly fulfilled when the distance of the eye is $59\frac{1}{2}$, the diameter being 200 as before.

This projection is also much used in maps of the world, but to simplify their construction, the meridians and parallels are projected into circular instead of elliptical arcs, the deviation from the strict law of the projection being too slight to affect the practical utility of the map.

Of Projection by Development.

The developments to be mentioned are two—the *Conical* and *Cylindrical.*

Conical Projection.—In this projection the sphere is supposed to be circumscribed by a cone, which touches the sphere at the circle intended to represent the middle parallel of the map. If the points on the sphere be now projected on the cone by lines drawn from the centre, it is clear that in a zone extending but a short distance on each side the middle parallel, as the zone *a a′ b b′*, the points on the cone would very nearly coincide in position with the corresponding ones on the sphere. All the delineations having been thus made, the cone is then conceived to be unrolled, or developed on a plane surface.



Should the map be made to extend much above or below the middle parallel, the distant parts will be very much distorted. To remedy the defects of this projection, various modifications have been suggested, among which those of Flamsteed are generally held in the highest estimation. [CONIC PROJECTION.]

Cylindrical Projection.—From what has been said of the cone, it will be easily understood that a cylinder may be applied to the sphere in a similar manner, and that a zone of very limited extent in latitude may, without very material error, be developed on a cylinder. The peculiarity of this method is, that the meridians, as well as the latitude circles, are projected in parallel strait lines; a condition of the map which makes it very applicable to nautical purposes, and on which (partly) is founded the very ingenious method called *Mercator's Projection*, which is now so universally adopted in our charts, and to which, in conclusion, we will briefly allude.

Mercator's Projection.—The line on which a ship sails, when directing her course obliquely to the meridian, is on the globe a spiral, since it cuts all the meridians through which it passes at equal angles. This circumstance, combined with others, rendered a map constructed on the principles of the spherical projections very inadequate to the wants of the navigator. Mercator considered, very justly, that mariners do not employ maps to know the true figures of countries, so much as to determine the course they shall steer, and the bearing and distance of those points or places which lie near their track; and this projection is the result of his efforts to secure to the seaman these desirable ends. The merit of this most useful method is thought by many to be more justly due to Wright; for although Mercator published his first chart in 1556, he omitted to declare the principles on which he proceeded, and his degrees of latitude did not preserve a just proportion in their increase towards the poles. Wright, in 1599, corrected these errors, and explained the principles of his improved construction, in which the degrees of latitude on the chart were made to increase towards the poles, in the same ratio as they decrease on the globe; by which means the course which a ship steers by the mariner's compass becomes on the chart a strait line; the various regions of the map, however distorted, preserve their true relative bearing, and the distances between them can be accurately measured.

MAPLE. [ACER.]

MARACAIBO. [VENEZUELA.]

MARAGHA. [PERSIA.]

MARANHAO (Province). [BRAZIL.]

MARANHAO, or S. LUIZ DO MARANHÃO, is a town on the northern coast of Brazil, in 2° 30′ 40″ S. lat. and 43° 50′ W. long. It lies on the north-western peninsula of an island, called Ilha do Maranhao. This island, which is nearly twenty miles long, extends along the shores of the continent, from which it is separated by a shallow channel, called Rio do Mosquito. This channel is, on an average, only 100 yards wide, and terminates in two large bays, the Bahia de S. Jozé on the east, and the Bahia de S. Marcos on the west. The island is generally low and swampy, and almost entirely covered with wood.

The town is built on the northern shores of a small peninsula, formed by two rivers, or rather small inlets of the sea, the Rio de S. Francisco on the north, and the Rio da Bacanya on the south. It is divided into two sections. The more ancient and populous part of the town, called Bairro da Praia Grande, extends along the shores on a broken surface. The streets are crooked, uneven, and badly paved; some of them are not paved at all. The houses have two or three floors, and are mostly built of sandstone. In this part of the town is a large square, surrounded by the palace of the governor, the college of the Jesuits, the town-hall, and the prisons, which are substantial buildings. At the back of this section lies the other, called Bairro de N. Senhora da Conceiçao, which consists of small houses, many of which are surrounded by gardens and plantations. Each division has its own parochial church, besides which there are three other churches, two chapels, and four churches belonging to four convents. The town is defended by three small fortresses, now in a dilapidated state.

The harbour is good and safe, but the entrance is difficult, on account of a bank called Coroa do Meio, about thirty miles north of the town, on the east and west of which are deep channels leading into the harbour. The eastern, which is the most navigated, has on the east the great bank, or Coroa Grande, which extends between the northern shores of the island and the Ilha de S. Anna. The tide rises eighteen feet in the harbour, and twelve feet without it.

The mean annual temperature is 80° of Fahrenheit. The regular succession of the sea and land breezes, and the prevalence of northern winds, moderate the heat, and the climate of the town is considered healthy. The population, which amounts to about 30,000, contains a great number of unmixed descendants of Portuguese and negroes, the half-breeds being comparatively few in number.

The inhabitants are chiefly engaged in commerce: only the most common articles of domestic use are made in the town; the rest are imported from Europe. The trade is rapidly increasing. The number of vessels that annually entered the harbour amounted to more than 140 twenty years ago; they came from Lisbon, Oporto, Viana, Liverpool, and New York. The imports consist of wine, brandy, oil, flour, fruits, silk, cotton and linen goods, hardware and metals, and articles brought from the East Indies, as spices, &c., and drugs. The exports are cotton, which is by far the most considerable article, rice, tanned and raw hides, &c. Sugar and coffee are imported from Pernambuco, Bahia, and other ports of Brazil. (Spix and Martius, *Reise in Brasilien.*)

MARAÑON. [Amazon.]

MARANS. [Charente Inferieure.]

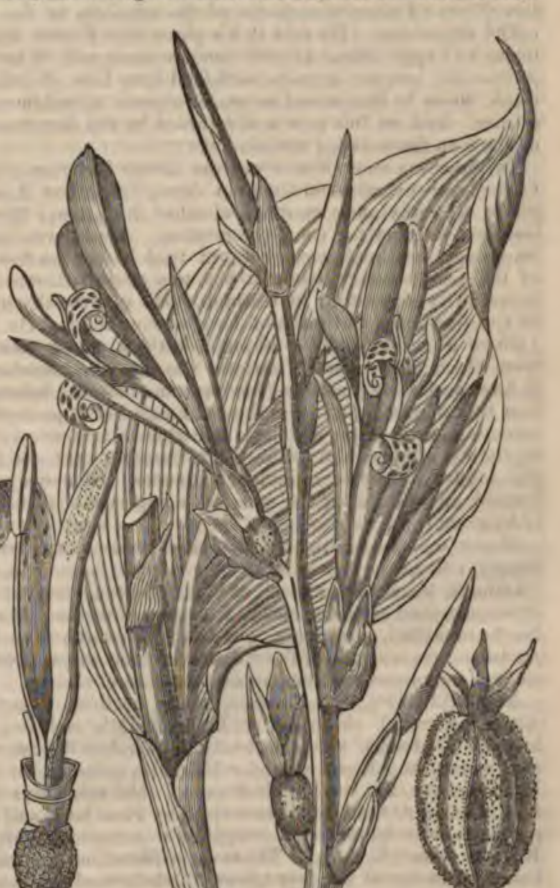
MARANTA ARUNDINA'CEA (Linn.). To this plant is referred the arrow-root of commerce, but it is also procured in large quantities from a variety of closely-allied, and even many distinct, plants. Thus the Surinam and Bermuda arrow-root is the produce of the M. arundinacea, while the Jamaica arrow-root is obtained from the M. indica (Tussac); which plant, along with several Curcumas, yields also the East Indian arrow-root. The West Indian arrow-root has mostly a pure white colour, the East Indian a yellow tinge.

The tubers, root-stocks, or offsets are grated or bruised, and repeatedly washed with water, which is passed through a fine hair-sieve, so long as it runs off with a milky appearance. It is allowed to subside, the supernatant water drained off, and the powder dried: 100 parts of the fresh plant yield 10 parts of arrow-root; but Benzon states 100 parts to yield 23 or 26 parts. According to the analysis of this chemist, it consists of volatile oil 0·07, starch 26, vegetable albumen 1·58, gummy extract 0·6, chloride of calcium, insoluble fibre 6, water 65·6. The volatile oil imparts a slight odour to the solution in warm water, which helps to distinguish genuine arrow-root from several of the articles substituted for it. Arrow-root has scarcely any taste, being bland and insipid; the powder, when pressed in the hand, emits a crackling noise, and retains the impression of the fingers, which common starch from wheat does not. Cassava (manioc, from Jatropha or Janipha Manihot) also retains the impression of the fingers, but it has more odour and a somewhat acrid taste.

The meals of any cereal grain may easily be distinguished from arrow-root by the nitrogen which they contain, and the ammoniacal products which they yield by distillation. Potatoe-starch is however most frequently used to adulterate arrow-root, or as a substitute for it. Microscopic observation of the form and size of the grains will point out the difference, as first indicated by Raspail (*Annales des Sciences Nat.*, t. vi.), those of arrow-root being smaller: the different habitudes of the starch with re-agents will also do this. (See MM. Payen et Chevalier, *Traité de la Pomme de Terre*, p. 126; see also *Journal de Pharmacie*, Août, 1833.) Potatoe-starch is not soluble in cold water, which is the case with arrow-root. Dissolved in absolute alcohol, arrow-root separates into two distinct portions, which neither wheat nor potatoe-starch does. In equal proportions dissolved in warm water, arrow-root yields a thinner solution, with a more slimy aspect than wheat-starch.

Arrow-root dissolved in water, milk, or any other appropriate vehicle, constitutes, from its easy digestibility, a most excellent article of diet for delicate persons and young children. It may be given plain, or with wine or spices, according to circumstances. The valuable property just mentioned does not belong to either wheat or potatoe-starch. The latter, if prepared from potatoes in spring, is very liable to disturb the stomach; but less so if prepared in October or November. Potatoe-starch may be prepared at a very cheap rate, and kept for a long period unchanged, thus affording a protection against times of scarcity. (Sir John Sinclair, *On the Culture and Uses of Potatoes*, Edinb. 1828.)

MARANTA'CEÆ, a natural order of endogenous plants, which have either no stems or annual ones only, whose leaves have diverging veins, and whose flowers are constructed with an inferior ovary surmounted by a three-leaved calyculus; very irregular flowers, white, red, or yellow; and a single stamen, whose anther has but one lobe.



Canna indica.

1, A flower with the calyx and petals cut off, the petaloid, stamen, and style alone remaining. 2, A capsule.

With the exception of the genus Calathea, and of Canna, which is commonly cultivated, under the name of Indian shot, because of its beautiful flowers, the species included in this order are of small size, and by no means attractive, but the fleshy tubers of some of them abound in starchy matter, which renders them nutritious. Arrow-root of the finest quality is obtained from Maranta arundinacea, and a similar product is yielded by Canna edulis and others. The order is known from Zingiberaceæ by the anther having but one lobe, instead of two.

All the species are found wild in tropical countries only.

MARASMUS (emaciation) is a term often used by the older medical writers to designate those cases in which no particular cause for the atrophy of the body was discovered. It is now very rarely employed, since the condition which was thus named is known to be the result of some local disease, by which the complete nutrition of the body is prevented, or by which a quantity of its material is constantly abstracted; as disease of the mesenteric glands, pulmonary consumption, &c.

MARA'T, JEAN PAUL, born near Neuchâtel in 1744, studied medicine at Paris. Although not deficient in intelligence and quickness, he wanted the application and perseverance requisite for the regular study of his profession, and he became an empiric. At the first symptoms of the Revolution in 1789, he showed himself a furious demagogue, addressing himself to the passions of the Paris populace, and preaching open insurrection and massacre. He was one of the members of the club of the Cordeliers, founded by Danton in 1790. He then became editor of a journal entitled 'L'Ami du Peuple,' which was hawked about the streets, and became a favourite with the lower orders. In this periodical he urged the poor to rise against the rich, the private soldiers against their officers, and the nation at large against the king. In 1792 he became a member of the first committee of public safety, and as such sent circulars all over France to recommend the massacre of the so-called aristocrats. He said in his paper that France would never be happy unless 270,000 heads were struck off by the guillotine; and he actually published long lists of individuals whom he denounced as proper objects of public vengeance. And yet this man was returned by the department of Paris to the national convention.

In the convention Marat was the declared enemy of the Girondins: he attacked them in April, 1793; but Robespierre, who was more cautious, checked him then: things were not yet ripe for their proscription. Marat was even impeached, and underwent a mock trial before his friends of the revolutionary tribunal, but was acquitted, and re-entered the convention in triumph. He saw the downfall of the Girondins, but did not long survive them. On the 13th of July, 1793, while taking a bath, a young woman from Normandy, named Charlotte Corday, was introduced to him, under the pretext of having some pressing information to communicate. She showed him a list of pretended aristocrats in her own district; and while Marat was reading it, she stabbed him to the heart, boasting that she had delivered France of a sanguinary monster. She was guillotined, and died with the greatest composure. [CORDAY D'ARMANS.]

Marat was proclaimed by the jacobins as a martyr of liberty, and his body was interred with great honour in the Pantheon, the former church of St. Généviève, from which it was removed after the end of the reign of terror. Marat has been called a madman, but there was method in his madness; he was one of those depraved men whom revolutionary convulsions throw up to the surface of society.

MA'RATHON, a small plain in the north-east part of Attica [ATTICA], about five miles in length and two in breadth (Dodwell), which is chiefly memorable for the victory which the Athenians under Miltiades gained over the Persians here, B.C. 490. [MILTIADES.] Marathon was the first place in Attica that was occupied by Pisistratus and his partisans, after he had been compelled to retire to Eretria in Eubœa. (Herod., i. 62.) The town of Marathon originally belonged to one of the four towns which formed the Tetrapolis, which consisted of Œnoe, Marathon, Probalinthus, and Tricorythus; but the name was afterwards applied to the whole district. (Steph. Byz., under τετράπολις τῆς Ἀττικῆς.) Marathon is about three miles from the sea, and is said by Plutarch to have derived its name from the hero Marathos. It is mentioned in the 'Odyssey' as a place of considerable importance (viii. 80); and it was near this place that the Athenians are said to have defeated Eurystheus, when they took up arms in defence of the Heraclidæ. Dodwell (*Classical Tour*, ii., p. 158) says that Marathon is 18 miles in a direct line from Athens to the village of Marathon; and that it is at least 22 miles by the shortest road to the commencement of the plain. According to Pausanias, it was half-way between Athens and Carystus in Eubœa (i. 32, § 3). Marathon belonged to the tribe of Leontis.

The plain of Marathon was watered by a small stream, called Asopus by Ptolemy, which forms marshes near the sea, in which, according to Pausanias (i. 32, § 6) a great many of the Persians perished. The Athenians who fell in the battle were buried in the plain; and also, but apart from the Athenians, the Platæans, Bœotians, and slaves. A large tumulus of earth still rises from the centre of the plain; and near the sea there are two others, much lower than the former. (Dodwell.) A little way above the plain, Pausanias mentions a natural cave, sacred to Pan (i. 36, § 6); which, according to Dodwell, is scarcely worth the trouble of visiting.

MARATTI, CARLO, the last painter of the Roman school, was born at Camurano, in the March of Ancona, in the year 1625. From his childhood he manifested a great fondness for drawing and painting. In his eleventh year he went to Rome, and became the favourite pupil of Andrea Sacchi, with whom he remained till he was 19 years of age. By studying the works of Raphael, the Caracci, and Guido Reni, he formed a style peculiar to himself, and acquired during his lifetime the reputation of being one of the first painters in Europe, though his talents were certainly not of the highest order. He was particularly celebrated for the lovely, modest, and yet dignified air of his Madonnas, which procured him the name of Carlo delle Madonne. He painted for Louis XIV. his celebrated picture of 'Daphne.' Pope Clement IX., whose portrait he painted, gave him a pension, and conferred on him an order of knighthood. The churches and palaces of Rome, which are filled with his works, are proofs of the esteem in which he was held. He was employed also in restoring the frescos of Raphael in the Vatican, and of Annibale Caracci in the Farnese palace. Fuseli says, 'The picture which gives the most advantageous opinion of his powers is "Bathsheba viewed by David," a work the charm of which it is easier to feel than to describe, which has no rival, and seems to preclude all hope of equal success in any future repetition of the same subject.' He also etched several beautiful plates. Of his pupils, the best known are F. Joranis and Chiari. He likewise promoted the art of engraving, and the famous engraver Jacob Frey was his scholar. In private life he was highly esteemed for his modesty and obliging disposition. He died at Rome in 1713, at the age of 88.

MARAZION. [CORNWALL.]

MARBECK, JOHN, who, as composer of the solemn and now venerable notes set to the *Preces* and Responses, which are still in use, with some alterations, in all our cathedrals, is entitled to our notice, was organist of Windsor during the reigns of Henry VIII. and his successor. A zeal for religious reformation led him to join a society in furtherance of that object, among the members whereof were a priest, a singing-man of St. George's chapel, and a tradesman of the town. Their papers were seized, and in the hand-writing of Marbeck were found notes on the Bible, together with a Concordance, in English. He and his three colleagues were found guilty of heresy, condemned to the stake, and all were executed according to their sentence, except Marbeck, who, on account of his great musical talents, and being rather favoured by Gardiner, bishop of Winchester, was pardoned, and lived to witness the triumph of his principles, and to publish his work, which appeared under the title of 'The Boke of Common Praier, noted;' the colophon being, 'Imprinted by Richard Grafton, printer to the kinges majestie, 1550, cum privilegio ad imprimendum solum.' In the same year appeared also his Concordance; and in 1574, 'The Lives of Holy Sainets, Prophets, Patriarchs, and others;' and subsequently his other books connected with religious history and controversy. It is stated by Sir John Hawkins, highly to the honour of Marbeck, that, 'under the greatest of all temptations, he behaved (after his trial) with the utmost integrity and uprightness, refusing to make any discovery to the hurt of others.'

MARBLE. A strict definition of this term is perhaps impracticable, unless, with Da Costa, we limit it to the calcareous rocks, 'of very lively colours, and of a constitution so fine that they will readily take a good polish.' In a vague sense other ornamental stones, as granite and porphyry, may be ranked among marbles, but the catalogue of the typical or calcareous marbles is long enough without these somewhat inconvenient additions. A limestone which will admit of being worked easily and equally in all directions is properly called 'freestone,' as the Bath or Ketton freestone; a rock of similar chemical composition, generally capable of being worked equally in all directions, and also of taking a good polish, deserves the title of marble; when it is granular and of a white colour, it may be useful in statuary.

Da Costa, in his 'Natural History of Fossils,' gives a large catalogue of marbles, disposed in a methodical order, which we shall follow in the following brief notices of this extensive subject.

Division I. Marbles of one plain colour.

Section 1. Black marbles. Most of these contain bitumen, and are fetid when bruised.

Examples. The Namur marble, the marble of Ashford in Derbyshire, Dent in Yorkshire, near Crickhowell, Tenby, Kilkenny, &c. The marble, antiently called Marmor Luculleum, and now Nero Antico.

Section 2. White marbles.

Examples. The marble of Paros, in which the Laocoon and Antinous are executed; the Carrara marble, of finer grain, much used in modern sculpture; the Skye marble, noticed by Dr. MacCulloch; that of Inverary, Assynt, Blair Athol, &c.

Section 3. Ash and grey marbles.

Examples. A beautiful marble, of compact oolitic texture, at Orelton, near the Clee Hills in Shropshire, deserves mention.

Section 4. Brown and red marbles.

Examples. The Rosso Antico; a rival to which, at least in colour, has been found on the estate of the duke of Devonshire, near Buxton. The mottled brown marble of Beetham Fell, near Milnthorp, is of good quality.

Section 5. Yellow marbles.

Example. The Giallo Antico. Siena marble, also dug at Mafra, near Lisbon. That used in antient Rome is said to be from Numidia.

Section 6. Blue marbles.

Example near St. Pons in Languedoc.

Section 7. Green marbles.

Example. The Marmor Lacedæmonicum of Pliny. It is dug near Verona.

Division II. Marbles of two colours.

Section 1. Black marbles variegated with other colours.

Example. Near Ashburton in Devonshire, Torbay in the same county, Bianco e Nero Antico, the African Breccia of the antients, Giallo e Nero Antico.

Section 2. White marbles variegated with other colours.

Example. Marble imported from Italy. Marbles of this general character occur in Siberia, at Plymouth, at Killarney, in Sweden, &c.

Section 3. Ash and grey marbles variegated with other colours. These are very numerous, and occur in various parts of Europe.

Section 4. Brown and red marbles variegated with other colours.

Section 5. Yellow marbles variegated with other colours.

Section 6. Green marbles variegated with other colours.

Examples. Egyptian marbles—the Marmor Tiberium and Augustum of Pliny; some Verde Antico, as that dug near Susa in Piedmont, the beautiful marble of Anglesey (called Mona marble), the marble of Kolmerden in Sweden.

Division III. Marbles variegated with many colours.

Example. Some of the Plymouth marble, the beautiful Brocatello or Brocade marble of Italy and Spain.

Marbles containing shells, corals, and other extraneous bodies.

In this division of marbles the British Islands are rich. Some of the Plymouth, Ashburton, and other Devonian limestones are extremely beautiful, from the abundance of fine corals exquisitely preserved in them; the crinoidal marbles of Flintshire, Derbyshire, and Garsdale in Yorkshire, are elegant examples of the carboniferous limestone; the shell marbles of Rance (Northamptonshire), Buckingham, Whichwood Forest, Stamford, Yeovil, may be noticed from the oolitic rocks; that of Petworth and Purbeck, from the Wealden strata, has been extensively used by the architects of the middle ages. In general the working of the English marbles is costly, and their use limited.

MARBLEHEAD. [Massachusetts.]

MARBURG, the capital of the province of Upper Hesse, in the electorate of Hesse-Cassel, is situated in 50° 50′ N. lat. and 8° 47′ E. long. It is built on the banks of the Lahn, which divides the town from the suburb of Weidenhausen. The town is situated on the side of a hill, and the streets are very steep. On the top of the eminence overlooking the town there is a large castle, which was formerly well fortified and was the residence of the landgrave. The town is partly surrounded by a wall, in which there are five gates. Marburg has a university, which was founded in 1527, by the landgrave Philip the Generous. This university has very considerable revenues, and all the usual appendages of the German universities, with a library of 100,000 volumes, an anatomical theatre, a lying-in hospital, a chemical laboratory, a veterinary school, a botanical garden, a philological seminary, cabinets of mineralogy, &c. The number of students, which in 1818 was only 220, was 359 in 1828, 422 in 1833, and at present is about 450. The town has one Calvinist, one Roman Catholic, a French Protestant, and two Lutheran churches, one hospital, two infirmaries, an orphan asylum, a school of industry, &c. The church of St. Elizabeth contains the fine monument of St. Elizabeth, which was however much damaged under the Westphalian government. Marburg being the seat of the provincial government, of the criminal tribunal, a board of trade, a commission of police, and a Lutheran superintendant, the inhabitants, 7520 in number, derive their chief support from the presence of these and from the university. The place has some manufactories of woollen, linen, cotton, hats, tobacco, and tobacco-pipes.

MARCA D'ANCO'NA, an old denomination of a geographical division of the Papal State, whose limits correspond in great measure to those of antient Picenum, and which is now subdivided into the three administrative delegazioni or provinces of Ancona, Fermo ed Ascoli, and Macerata e Camerino. This fine region extends from the frontiers of Abruzzo to the boundaries of the former duchy of Urbino, now the province of Pesaro e Urbino, and from the Apennines to the Adriatic, along which sea it occupies a line of coast more than sixty miles in length. It has been called La Marca, 'the March,' since the time of the Carlovingian emperors and kings of Italy, from being governed by marchiones, or marquises, in the same manner as the Marca Trevigiana, or province of Treviso, in the county of the Veneti. [Treviso.] March ('mark,' in German) meant originally a frontier district, but the term was afterwards applied rather capriciously, and the number of marquisates was multiplied in various parts of the revived Western empire. In the time of the Longobards the county, afterwards called Marca, was called Pentapolis, from its five principal towns, Ancona, Fanume, Pisaurum, Auximum (now Osimo), and Humana or Numana. The name of Marchia Anconæ is found in a diploma of the emperor Frederic I., of 1162. His son Henry VI. united it to the duchy of Ravenna. Innocent III. conquered the March, and placed it under the allegiance of the Roman see. During the troubles of the middle ages it was divided among several petty princes or tyrants, Varano of Camerino, Sforza, and others. Cesare Borgia subdued the country by force and treachery, and it became from that time annexed to the papal territories. It was then generally called Marca d'Ancona, from its principal town; but the south-east part of it was also sometimes called Marca di Fermo, and the two together were often designated, in the plural number, 'Le Marche.'

The Picentes, or antient inhabitants of Picenum, are said to have been a colony of the Sabines. Their country extended along the Adriatic, from the Æsis to the Truentum, which are also the limits of the modern Marca; but the Prætutii, who lived south of the Truentum as far as th river Matrinus (now Piomba), and formed a separate co munity, are included by Pliny and other antient geographers within the boundaries of the Picenum. The Æsis separated the Picentes from the country of the Senones; but some antient writers have considered the Picenum to extend as far as Ariminum. Asculum, Firmum, Pollentia, Ricina (believed to be Macerata), Treia, and Tollentinum, were towns of the Picentes. The Picentes made alliance with Rome, B.C. 299. During the war of Pyrrhus they joined the Samnites, Lucanians, and others against Rome, were defeated, sued for peace and obtained it, and a Roman colony was sent to Ariminum on that occasion. (Livy, *Epitome XV.*) Picenum then became a Roman province, and was administered by a proconsul.

The Picentes were foremost in the league of the Italian nations in the Social war: they killed the proconsul Servilius, and defeated Cn. Pompeius Strabo, but were afterwards defeated by him. [ASCOLI.] They however obtained the civitas, like the other Italian people.

The actual delegazione of Ancona, bounded on the east and north-east by the Adriatic, on the north-west and west by the province of Pesaro e Urbino, and on the south by Macerata e Camerino, contains 155,000 inhabitants, distributed among six towns and thirty-four 'terre,' having communal councils. The principal towns are, 1, Ancona; 2, Jesi (the antient Asium), with 14,000 inhabitants; 3, Osimo, with 5000 inhabitants. (Calindri, *Saggio Statistico.*) The account of the other two provinces is given under FERMO ED ASCOLI and MACERATA E CAMERINO.

(Compagnoni, *Reggia Picena;* Colucci, *Antichità Picene,* 31 vols. 4to., Fermo, 1786-97.)

MARCELLIN, ST. [ISERE.]

MARCELLI'NUS. [AMMIANUS MARCELLINUS.]

MARCELLI'NUS was bishop of Rome in the reign of the emperor Diocletian. He has been represented by some as having, through fear during the persecution raised under that emperor, offered incense to the heathen deities, but this is contested by others. He died A.D. 304.

MARCELLO, BENEDETTO, a patrician of Venice, son of Agostino Marcello, a senator, was born in 1686. His elder brother, Alessandro, who was much distinguished for his knowledge in natural philosophy and mathematics, as well as for his musical acquirements, had weekly music-parties at his house, to which probably the early predilection of Benedetto may be attributed. Among the masters to whom the care of his education was assigned are mentioned Gasparini and Lotti, under whom he studied composition, but we do not find that he produced anything particularly worthy of notice till 1716, in which year a serenata from his pen was performed at Vienna, when the birth of the first son of the emperor Charles VI. was there celebrated with much ceremony and splendour.

His great work, and that to which is to be ascribed the celebrity of his name throughout Europe—for as a Venetian noble he would have been known only in a small district, and but for a brief period—was published in 8 vols. folio, in the years 1724 and 1726, under the title of *Estro Poetico-armonico, Parafrasi sopra i 50 primi Salmi, Poesia di G. A. Giustiniani, musica de B. Marcello, patrizi Veneti.* The learned M. Suard, whose reputation as a musical critic once stood high, seems to approve the rather strong term with which this title commences; for, says he, nothing equals the enthusiasm that reigns in all these compositions; it transfers to music the energy of Oriental thought, and converts the composer at once into a Pindar and a Michael Angelo. Whatever may have been the degree of enthusiasm possessed by Marcello—and doubtless it was great—there is certainly too much of it in this opinion. Graceful and appropriate melody, supported by harmony of the purest kind, is his true characteristic. He occasionally, though not often, is grand, but this grandeur springs out of simple sources, and does not count learned combinations and complicated parts among its elements. In his style is to be traced sound musical knowledge, guided by good sense and polished by good taste. He is always elegant, never gorgeous, and as to the sublimity implied in the remark of the French critic, we have never discovered any signs of it in the works of the noble Venetian, much as we admire them for other valuable qualities.

Mr. Avison, in his well known *Essay on Musical Expression,* carries his admiration of Marcello's Psalms to great lengths, and leaves us to infer that he considers them at least on a level with the works of the Italian's great contemporary, Handel. Time has shown the extravagance of this opinion, and assigned to the Venetian composer his true rank, which undoubtedly is high, but far from being of the loftiest kind. Avison however evinced the sincerity of his admiration by issuing proposals for publishing an edition of the *Salmi* set to English words; but the execution of this design devolved on Mr. Garth, organist of Durham, who very skilfully adapted to the music our own prose translation of the Psalms, and published the work (which is now to be found in most musical libraries) in eight handsome folio volumes.

Marcello composed many other works besides his Psalms, but few, if any of them, have survived. He did not confine his attention to music, but was an active magistrate, and during many years one of the Council of Forty. He died in 1739.

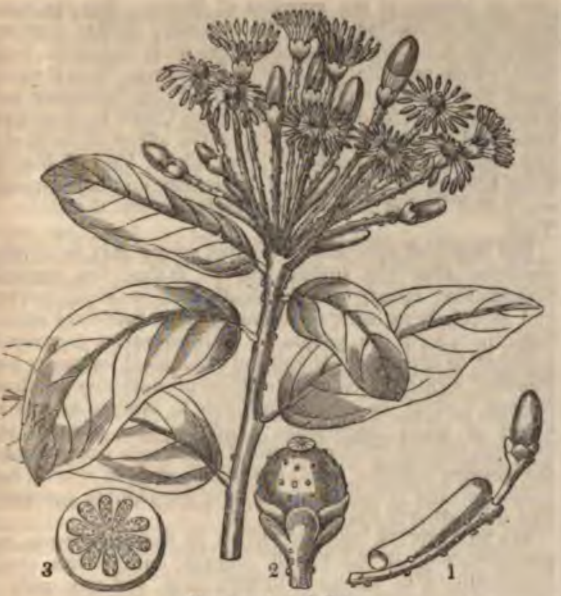
MARCELLUS, MARCUS CLAUDIUS, born of a Roman consular family, after passing through the offices of ædile and quæstor, was made consul B.C. 224. The Transpadane Gauls having declared war against Rome, Marcellus marched against them, defeated them near Acerræ on the Addua, killed their king Viridomarus, and carried off his arms, the 'spolia opima,' which were exhibited in his triumph. At the beginning of the second Punic war, Marcellus was sent to Sicily as prætor to administer the Roman part of the island, and had also the task of keeping the Syracusans firm to their alliance with Rome. After the battle of Cannæ he was recalled to Italy, to oppose Hannibal. He took the command of the relics of the Roman forces in Apulia, kept Hannibal in check, and defended Nola. In the year 214 B.C., being again consul, he took Casilinum by surprise. He was next sent to Sicily, where Syracuse had declared against Rome. [HIERONYMUS.] After a siege of nearly three years, the town was taken in the year 212 B.C., and Marcellus returned to Rome with the rich spoils. Archimedes lost his life on the occasion of this taking of Syracuse. [ARCHIMEDES.] Marcellus did not obtain the triumph, but only the ovation, as the war in Sicily was not entirely terminated. In the year 210 he was again chosen consul, and had the direction of the war against Hannibal in Apulia, when he took the town of Salapia, and fought several partial engagements with the Carthaginians without any definite result. In the following year he continued in command of the army, and fought a battle against Hannibal near Canusium, in which the Romans were defeated and ran away. On the following day Marcellus renewed the fight and defeated the Carthaginians, upon which Hannibal withdrew to the mountains of the Bruttii. In the next year, B.C. 208, Marcellus was elected consul, for the fifth time, with T. Quintus Crispinus. He continued to carry on the war against Hannibal, when, being encamped near Venusia, he rashly ventured out, fell into an ambuscade of advanced posts, and was killed. Hannibal caused his body to be buried with honours. (Livy, xxvii. 2, 14, 29.) He was one of the most distinguished Roman commanders during the second Punic war, and had the honourable reputation of a disinterested man.

MARCELLUS, EMPI'RICUS, was born at Bordeaux, and was *magister officiorum* in the reign of Theodosius the Great. The only work of his which has come down to us is entitled 'De Medicamentis empiricis, physicis et rationalibus,' published at Basle, 1537, Venice, 1547; and with the 'Medici Principes,' Paris, 1567. Though Marcellus does not appear to have belonged to the medical profession, he gives us much curious information respecting the manner in which medicine was studied at that time in Gaul.

MARCELLUS I. succeeded Marcellinus as bishop of Rome, but we know little of him, except that he is said to have been strict in enforcing the discipline of the church. He died A.D. 310.

MARCELLUS II. was elected after the death of Pope Julius III. in 1555, but died in less than a month after his election. He was succeeded by Paul IV.

MARCGRAA'VIACEÆ, a natural order of Polypetalous exogens, having an imbricated calyx, numerous hypogynous stamens, and a superior ovary with a discoid stigma and many polyspermous cells. They are all inhabitants of the tropical parts of America, and are usually scrambling shrubs, which are sometimes true parasites. The order is of no known use, and of but little interest, except in a systematical point of view; unless for the sake of its very curious bracts, which vary in form in different species, but which are usually more or less pitcher-shaped.



Marcgraavia umbellata.

1, a pitcher-shaped inverted bract adhering to the peduncle of an unexpanded flower; 2, a ripe fruit seated in the persistent imbricated calyx; 3, a transverse section of the same.

MARCH, the third month of the year according to modern computation, containing thirty-one days. The Roman year originally began with March [JANUARY], and was in fact so considered in England before the alteration of the style, the legal year commencing on the 25th of March. Our Anglo-Saxon ancestors called it most commonly *Hlyd monath*, loud or stormy month; and sometimes *Hræd* or *Rhæd monath*, which some interpret Rheda's, others *Rhede* or *Rethe*, the rugged or rough month. The name of the month is said to be derived from that of Mars, the god of war.

Before 1564 the computation of the French year began from Easter, so that occasionally the same year might comprehend two months of March, *Mars avant*, and *Mars après*. If Easter occurred in March itself, the month began in one year and ended in another. The change of computation from the first of January to Easter, in that country, was directed by an edict of Charles IX.

There is an old proverb, mentioned by various writers, which represents March as borrowing certain days from April. These are called, by the rustics in many parts both of England and Scotland, the *Borrowed Days*. They are particularly noticed in the poem called 'The Complaynt of Scotland :'

> 'March said to Aperill,
> I see three hogs upon a hill;
> But lend your three first days to me,
> And I'll be bound to gar them die.
> The first it shall be wind and weet,
> The next it shall be snaw and sleet,
> The third it shall be sic a freeze,
> Sall gar the birds stick to the trees.
> But when the borrowed days were gane,
> The three silly hogs came hirplin hame.'

Dr. Jamieson, in his 'Etymological Dictionary,' says, 'These days being generally stormy, our forefathers have endeavoured to account for this circumstance by pretending that March *borrowed* them from April, that he might extend his power so much longer. . . . Those,' he adds, 'who are much addicted to superstition, will neither borrow nor lend on any of these days. If any one would propose to borrow of them, they would consider it as an evidence that the person wished to employ the article borrowed for the purposes of witchcraft against the lenders.'

Ray, in his Collection, has a different proverb relating to this month, viz. that 'A bushel of March dust is worth a king's ransom;' thereby expressing the importance of dry or dusty weather at this particular season of the year, in an agricultural point of view.

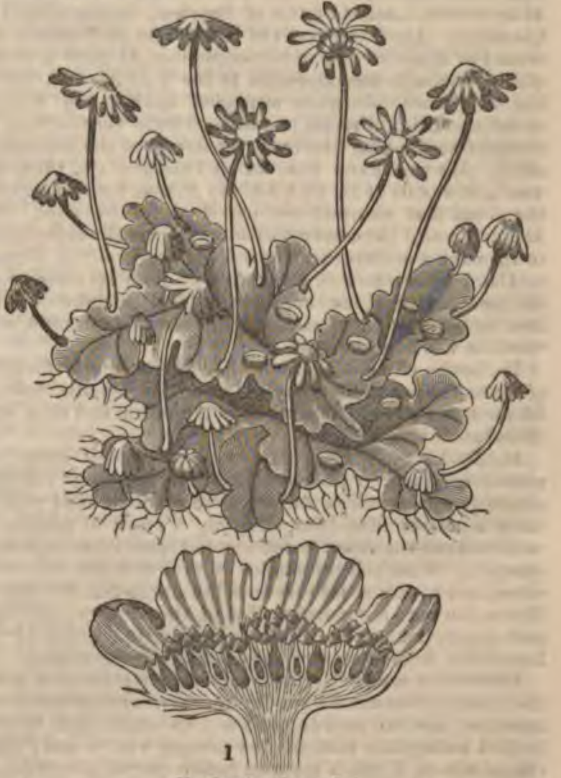
(Brady's *Clavis Calendaria*, 8vo., Lond., 1812, vol. i., p. 63; Furetière, *Dictionnaire Universel*; Brand's *Popular Antiquities*, 4to. edit., vol. i., pp. 86, 460.)

MARCH, in music, is, properly speaking, an air in duple time, played by martial instruments—*i.e.* by inflatile and pulsatile instruments—to mark the steps of the infantry, as well as to amuse and cheer troops of all kinds. It however has long since gained admission wherever music is heard, and consequently is written for every kind of musical instrument. Hence some of the most striking compositions by the greatest masters; as, for instance, the marches in Handel's oratorios; the religious marches (*Marches religieuses*) in Gluck's *Alceste* and Mozart's *Zauberflöte*; the two funeral marches (*Marcie funebri*) of Beethoven, &c.

The true March is always written in common time, or in what is called a compound of that measure, and begins on a broken part of the bar, with an odd crotchet or a quaver. It is slow for grand or parade occasions, quick for ordinary marching. We are told by Rousseau, that Marshal Saxe used the march also for the purpose of accelerating or retarding the pace of his troops in battle. In his days there was more form, more ceremony used; something like etiquette was kept up in fighting: we doubt whether the movements of the battalions in the fields of Austerlitz and Waterloo were performed to musical movements, or even to the simple beat of drums.

MARCHANTIA'CEÆ, a small natural order of Acrogens or Cryptogamic plants, forming part of the old group called Hepaticæ. They are plants of a low organization, in most instances having no distinction of leaves and stem, but a thin, leafy, lobed thallus in their room, in which respect they resemble lichens, but are furnished with breathing pores and an approach to spiral vessels in the form of elaters, which latter circumstances elevate them to the level of Lycopodiaceæ and Marsileaceæ.

Marchantiaceæ differ from Jungermanniaceæ, with which they were formerly combined under the old name of Hepaticæ, in not having a distinct stem, and in their fruit not being four-valved. Marchantia itself, a common plant under the north side of old walls and hedges, upon damp ground, forms deep green patches with a lobed lichenoid thallus, and has reproductive organs of two kinds arranged separately below mushroom-shaped heads; one of them appears to be male and the other female. None of the species are of any known use.



Marchantia polymorpha.

1, A vertical section of an involucrum, with the young capsules imbedded in the receptacle.

Endlicher separates the order into four, with the following distinctive characters:—

1. RICCIACEÆ. Frondose. Involucre none. Capsules bursting irregularly. Elaters none. Aquatics.

2. ANTHOCEROTEÆ. Frondose or leafy. Involucre none. Capsules 1-2-valved, with a central columella. Elaters.

3. Targioniaceæ. Frondose. Involucre heterogeneous. Capsules opening by teeth. Elaters.

4. Marchantiaceæ. Frondose. Both involucre and involucel. Capsules various, opening irregularly by teeth. Elaters. Flowers capitate.

MARCHE, LA, one of the provinces or military governments into which France was divided before the Revolution. It was bounded on the north by Berri, on the east by Auvergne, on the south by Limousin, and on the west by Poitou and a small portion of Angoumois. Its name, which denotes a frontier district, was derived from its situation on the border of Limousin (of which province it was formerly accounted a subdivision, being sometimes called La Marche du Limousin) toward Poitou and Berri. It was subdivided into La Haute Marche (Upper Marche), on the east side, of which Gueret (population 3100 town, 3921 whole commune) was the capital, and Aubusson (pop. 4354 town, 4847 whole commune), Bourganeuf (pop. 2110 town, 2849 whole commune), and Felletin (pop. 2816 town, 3228 whole commune), chief towns; and La Basse Marche (Lower Marche) on the west side, of which Bellac (pop. 3025 town, 3607 whole commune) was the capital, and Le Dorat (pop. 1805 town, 2237 whole commune) and Confolens (pop. 2215 town, 2687 whole commune), chief towns. La Haute Marche now constitutes the department of Creuse; La Basse Marche is included in the departments of Haute Vienne, Indre, and Charente.

This district was included in the territory of the Lemovices, a Celtic nation, who also occupied Limousin. In Roman Gaul it was comprehended in the province of Aquitania Prima, and afterwards was successively occupied by the Visigoths and Franks, under the latter of whom it made part of the duchy and kingdom of Aquitaine. In the tenth century it formed a county under Boson I., who was also count of Perigord. The county of Marche continued in the possession of the descendants of Boson until the beginning of the fourteenth century, when it was seized by Philippe IV. le Bel. It was subsequently given by Philippe V. le Long, as an apanage, to his brother Charles, who, upon coming to the crown, exchanged the county of Marche with Louis I., duke of Bourbon, for the county of Clermont. Upon the death of Louis, duke of Bourbon, the county of Marche came to his second son, Jacques or James of Bourbon, who was appointed by the king Jean II. constable of France. Jacques struggled against the English under the Black Prince, but with so little success that he resigned to the king his sword, the ensign of the constable's office. He was taken prisoner at Poictiers, A.D. 1356, and was killed A.D. 1361, with his son Pierre, fighting against the disbanded mercenaries, called the Tard-venus, near Lyon. [Lyon.] The county of Marche passed subsequently to the counts of Pardeac, a branch of the family of Armagnac, and from them to the dukes of Bourbon; and upon the confiscation of the territories of Charles, duke of Bourbon, by Francis I., it came to the crown, A.D. 1523, with which it was finally united.

The name of La Marche or Les Marches was formerly given to the frontier of Basse (Lower) Normandie, towards Maine and Perche. The towns of Argentun and Séez were included in this district.

MARCHES, THE. *Mark*, Anglo-Saxon meaꞃc, is a word common to almost all the languages of Teutonic origin, in sense scarcely varying from the word as at present used, a *mark*. But from denoting a *mark* in general, it came to denote in a specific and peculiar sense those important *marks* by which the boundaries of wide domains were indicated, and in this sense it is found in Anglo-Saxon writings. Hence the word *the marches*, that is, the country lying near and about the *marks* which indicated the limits of two kingdoms, dukedoms, or other extensive jurisdictions.

The word is used in Germany, and upon it is founded one of their titles of honour, the *markgraf* (*margrave*), or lord of the marches; and our own *marquis* is of the same origin, though it does not appear that the few persons who in early times (there was no English marquis before the reign of Richard II.) bore this title had any particular connection with the marches.

Great part of England being bounded by the sea, there could be but little march-land. But on the side toward Wales, and in the north where England abuts upon Scotland, there was march-land: and when we speak of the marches, the land near the borders of the two countries is what is meant.

Wales being conquered by King Edward I., we hear little in history of the marches of Wales. But the term continued in use long after the conquest of that country. The great family so celebrated in the early history of England, whose hereditary name was De Mortuo Mari ('of the Dead Sea'), contracted and Gallicized into Mortimer, and whose chief residence was at Wigmore Castle in Herefordshire, had the chief management of the affairs of the Welsh marches, and was known by the title of Earl of March. King Edward IV., their lineal descendant and heir-general, was called Earl of March while his father was the Duke of York.

But Scotland remaining a distinct sovereignty for several centuries after the subjugation of Wales, the marches towards that country are frequently mentioned in history, and especially as being the scene of those predatory excursions in which the people of both countries frequently engaged, or of conflicts arising out of national jealousies and disputed rights. The maintenance of authority in those regions, lawless, or constantly liable to become so, was an object of great importance; and for this purpose the marches towards Scotland were divided into two portions, the western and the middle marches, each of which had courts peculiar to itself, and a kind of president or governor, who was called the warden.

MARCIA'NUS, born in Thrace, of obscure parents, towards the end of the fourth century, entered the army, rose gradually by his merit to high rank, and was made a senator by Theodosius II. When Theodosius died (A.D. 450) his sister Pulcheria, then fifty-two years old, offered her hand to Marcianus, who was near sixty, because she thought him capable of bearing the crown with dignity and advantage to the state. Marcianus married her, and was proclaimed emperor. His reign, which lasted little more than six years, was peaceful, and his administration was equitable and firm. He refused to pay to Attila the tribute to which Theodosius had submitted. In the year 455 Marcianus acknowledged Avitus as emperor of the West. Marcianus died in 457; his wife Pulcheria had died before him. He was succeeded by Leo I.

MARCHIENNES. [Nord.]

MARCIONITES, a religious sect of the second and third centuries of our æra, so called from their teacher Marcion, a native of Sinope and a priest, who adopted the old Oriental belief of two independent, eternal, co-existing principles, one evil and the other good. He endeavoured to apply this doctrine to Christianity, asserting that our souls are emanations of the good principle, but our bodies and the whole visible world are the creation of the evil genius, who strives to chain down our spiritual nature by corporeal fetters, so as to make the soul forget its pure and noble origin. He further maintained that the law of Moses, with its threats and promises of things terrestrial, was a contrivance of the evil principle in order to bind men still more to the earth; but that the good principle, in order to dissipate these delusions, sent Jesus Christ, a pure emanation of itself, giving him a corporeal appearance and semblance of bodily form, in order to remind men of their intellectual nature, and that they cannot expect to find happiness until they are reunited to the principle of good from which they are derived. Marcion and his disciples condemned all pleasures which are not spiritual; they taught that it was necessary to combat every impulse that attaches us to the visible world; they condemned marriage, and some of them even regretted the necessity of eating of the fruits of the earth, which they believed to have been created by the evil principle. The Marcionites spread far in the East, and especially in Persia. The chief opponent of Marcion was Tertullianus, who wrote a book to refute his doctrines.

(Tertullianus *Adversus Marcionem;* Pluquet, *Dictionnaire des Hérésies.*)

MARDIN, a town of Northern Mesopotamia, built on a steep hill which forms part of the chain that divides the basin of the Upper Tigris, or country of Diarbekr, from the plains of Sinjar, which are watered by the affluents of the Euphrates. Mardin is a considerable though poor town, and is said to contain 20,000 inhabitants, two-thirds of whom are Moslems, and the rest Christians, with some Jews. The Christians are divided between Syrians of the Greek Church, Nestorians, and Armenians. The Syrians, who are the most numerous, have two churches in the town and two convents in the neighbourhood. They read their church service in the Syriac language, which few of the congregation understand, the vulgar tongue being the Arabic. Their patriarch showed to Mr. Buckingham a handsome copy of the Gospels in Syriac, written on parchment, richly illuminated, and bearing the date of 1150.

Mardin has eight mosques, several bazaars, and some public baths. The castle, which is built on the summit of the hill above the town, is strong by its situation. The town of Mardin is nearly half-way between Diarbekr and Mozul, and on the road from Constantinople to Bagdad.

(Niebuhr; Buckingham.)

MAREMME, the name given in Italy to the unwholesome lowlands which extend along the coast of the Mediterranean. The name is especially applied to the lowlands of Tuscany and of the Papal State, which are the most extensive. The Maremme may be divided into basins. The first basin begins north of Lucca, and extends along the sea-coast as far as Leghorn, south of which town the ridge of Montenero projects as far as the sea-coast. This basin extends inland from ten to twelve miles to the hills east of Pisa; it also includes the lowest part of the course both of the Serchio and the Arno, and is called Maremma Pisana. The next basin is that of the Cecina, a river which enters the sea about eighteen miles south of Leghorn. This basin, which is called the Maremma of Volterra, is of small extent, for the hills again approach close to the sea a few miles south of the mouth of the Cecina. The third basin begins at Piombino, and extends as far as Monte Argentaro, a distance of about 60 miles in a direct line. It stretches from 10 to 20 miles inland, and includes the lower course of the rivers Cornia, Bruna, Ombrone, and Albegna, and the lakes or marshes of Castiglione and Orbetello. This large tract is called Maremma Senese, because it forms part of the province of Siena. It is also called the Maremma of Grosseto, from the town of that name which is situated in the midst of it. A description of these tracts, which constitute the Tuscan Maremme, is given under PISA and SIENA (Provinces).

The Roman Maremma, which is a continuation of that of Siena (for there is no interruption of hills near the coast between one state and the other), begins at the river Pescia, which marks the boundary of the two countries, and extends as far as Terracina on the frontiers of Naples. The whole of this tract, of more than 120 miles in length, is low and unhealthy; but its depth inland is very unequal, owing to various offsets of the lower Apennines, and also to detached ridges which approach the sea without coming close to it, and which partly enclose the lowlands. The Roman Maremma may therefore be divided into three basins. 1. That of the lake of Bolsena, including the banks of that lake and the course of its outlet, the river Marta, as well as the rivers Fiora, Arone, and Mignone. The mountains of Santa Fiora, on the borders of Tuscany, bound this basin on the north-west; and Mount Cimino, which is of volcanic formation, on the south-east, divides it from the basin of the Tiber. The lower steps of the ridge of Cimino approach the sea at La Tolfa, near Civitavecchia. This basin, which is generally called the Maremma of Corneto, includes the districts of Corneto, Montalto, Canino, Castro, and Civitavecchia. A description of it is given under PAPAL STATES.

The second basin, that of the lower Tiber, extends from Civitavecchia to Anzo. The volcanic ridge of the Alban Mount divides it on the south-east from the basin of the Pomptine Marshes. A description of both, with some account of the various phenomena of the soil and atmosphere, is given under CAMPAGNA DI ROMA. The Maremme are of two kinds; some are marshy, and others dry, but both are unwholesome, especially in summer.

The name of Maremma is not commonly used in the kingdom of Naples to designate the unhealthy lowlands of that country, which are also extensive, but the synonymous word Paduli, a corruption of paludi, is used instead.

The Tuscan government has of late years effected great improvements in its Maremma; the marshes have been drained, the lakes embanked, the ground has been brought into tillage, and colonies established. The government has published an interesting account of the works executed for these objects, with an atlas, fol., Florence, 1838.

MARENGO. [ALESSANDRIA; BONAPARTE.]

MARENNES. [CHARENTE INFERIEURE.]

MARE'NZIO, LUCA, certainly the most voluminous, and, in the opinion of many, the best of all the composers of madrigals, was born at Concaglia in Brescia, about the middle of the sixteenth century. His parents were poor, but his fine voice recommended him to the protection of the principal ecclesiastic of the place, who had him instructed in music by Giovanni Contini, the author, we are told, of many sacred compositions. His first appointment was as *maestro di Capella* to the cardinal Luigi d'Este, and at Rome, says Adami, he was beloved and caressed by many great personages, and among the number by the king of Poland, on whose invitation he paid a visit to the dominions of that monarch. Peacham, in his 'Complete Gentleman,' tells us that he was 'in displeasure with the pope, for overmuch familiarity with a kinswoman of his holiness,' which was the cause of his quitting Italy for a time. He states other particulars relative to this, which are extraordinary at least, and not now worth investigating. Marenzio returned however to the papal city, and was admitted into the pope's chapel, but in what capacity does not appear; Peacham says as organist; Dr. Burney denies this, assigning as the reason of his disbelief, that in the papal chapel there is no organ. The former, who certainly was acquainted with Marenzio, describes him as a 'little black man,' and mentions the first, second, and third parts of his *Thyrsis*, as 'songs the Muses themselves might not have been ashamed to compose.' He died at Rome in 1599.

In relation to his style of composition the Italians described him as *il piu dolce cigno* (the sweetest swan), and the praise thus poetically expressed was perfectly just. Indeed as respects tenderness of air and gracefulness of harmony he has had few rivals. In vigour of imagination he has superiors, among whom our own best English madrigalists may be named without incurring the charge of national partiality. Even Peacham, his eulogist, mentions several English composers who, he says, 'are inferior to none in the world (how much soever the Italian attributes to himselfe) for depth of skill and richnesse of conceipt.' As he was one of the earliest composers of eminence, his works have been open to all, and he has been more or less imitated by many writers of vocal music in parts. Handel and Purcell, as Dr Burney remarks, did not disdain to become his debtor.

MAREO'TIS. [ALEXANDRIA; EGYPT.]

MARGARET, daughter of Waldemar III., king of Denmark, married in 1363 Haquin, king of Norway, on the death of Waldemar. In 1375 Margaret's son Olaus, then a minor, succeeded to the crown of Denmark under the guardianship of his mother. His father Haquin dying, Margaret was acknowledged queen of Norway. Olaus died in 1387, and the Danes also acknowledged Margaret as their queen. She turned her arms against Albert, king of Sweden, who was not popular with his subjects, defeated him, and made him prisoner, and was then acknowledged queen of Sweden. After seven years' confinement, she released Albert, on condition of his formally renouncing the crown of Sweden. In 1396 the estates of the three kingdoms assembled at Calmar, where it was agreed that in future they should all be ruled by one and the same sovereign. This act was called the 'Calmar Union.' On this occasion Margaret designated her nephew Erick as her successor. She died in November, 1411, being 59 years of age.

Margaret had many great qualities; but her political conduct, especially in her transactions with Sweden, was not free from duplicity and violence. To the Danes however she proved a good queen. She loved pomp and splendor, was brave and resolute, and had rather the qualities of the stronger sex than those of her own. [ERICK XIII. of Sweden.]

MARGARET OF ANJOU. [HENRY VI.]

MARGARET OF RICHMOND. [HENRY VII.]

MARGARIC ACID, a fatty acid, so called by Chevreul, who discovered it, from 'margarites' (μαργαρίτης), *a pearl*, on account of its peculiar lustre. It is prepared from soap made with olive-oil and potash; this is to be perfectly dried, and then macerated for twenty-four hours in twice its weight of cold alcohol. The *oleate of potash*, which the soap also contains, is dissolved by the alcohol, while the margarate of potash remains unacted upon; this is to be well washed with cold alcohol, and then dissolved in 200 parts of boiling alcohol: on cooling, the margarate of potash crystallizes; and as it contains a little oleate, it is to be crystallized a second time: it is then to be decomposed, and the margaric acid precipitated by the addition of hydrochloric acid.

The properties of this acid are, that on cooling, after fusion, it crystallizes in pearly needles; it is insoluble in water, and hence its precipitation from its compounds and solution by the stronger acids. It has an acid reaction; and its salts, except those of the alkalis, are very sparingly soluble in water. Its saline compounds are termed *margarates*.

Acccording to the analysis of Berzelius, it consists of—

Thirty-three equivalents of hydrogen	33	or	12·59
Thirty-five equivalents of carbon .	210		78·38
Three equivalents of oxygen . .	24		9·03
Equivalent	267		100·

The crystals contain 3·4 per cent. of water, which can be separated only by converting the acid into a margarate by combining it with a base.

Margarate of Potash is obtained as above stated by the action of alcohol on soap made of olive-oil and potash; it separates from its solution in boiling alcohol in brilliant scales: with ten times its weight of water, at about 158°, it forms a limpid solution, which begins to become turbid at about 140°, and at 60° it becomes gelatinous; a larger quantity of water partially decomposes it, and converts it into bimargarate: at 55°, when exposed to a moist atmosphere, it absorbs its weight of water without becoming liquid; 100 parts of alcohol are capable of holding 1·21 part in solution when cold, 10 parts when hot. Æther, when heated, separates a little margaric acid.

Bimargarate of Potash is soluble in hot alcohol, 100 parts (of sp. gr. 0·834) dissolving 31·17 parts at 148° Fahr., of which however only 1·13 part remains dissolved at 68°.

Margarates of Soda strongly resemble those of potash: the neutral salt dissolves in 10 times its weight of water at 172°, and the solution becomes gelatinous at 148°, and contains a little acidulous salt.

Margarates of Lead.—Of these there are three, a sub-, neutral-, and super-salt. The neutral is produced by double decomposition: it contains combined water, and fuses at about 170°: boiling alcohol of sp. gr. ·823 dissolves about $\frac{1}{100}$ of its weight; it is less soluble in boiling æther.

When fat is boiled with the alkalis, as in preparing soap, it appears that the elements of the fat, without either yielding anything to or absorbing anything from the air, are converted into one or more fatty acids and glycerin; to these changes the elements of the water however contribute; the new acids, combining with the alkalis, form soap, which collect on the surface of the fluid, while the glycerin remains in solution.

MARGARIN, a peculiar fatty matter contained in vegetable oils, and also in animal fats, as mutton-suet and hog's-lard: when these have been treated with æther, for the purpose of obtaining stearin from them, the æthereal liquors, by spontaneous evaporation, deposit a portion of the solid matter which they contain, and this is to be collected on a linen cloth, strongly pressed, and then exposed for a long time to the heat of a salt-water bath. This substance is very soluble in cold æther, which distinguishes it from stearin. It appears probable however that by boiling in alkaline solutions it is converted into stearic acid; but additional experiments are required to determine its nature with precision.

MARGARI'TA, Dr. Leach's name for the 'Concha margaritifera or Matrix Perlarum, *Mytilus margaritiferus* of Linnæus, *Meleagrina margaritifera* of Lamarck. [Avicula.]

MARGARITA'CEA, M. de Blainville's name for his third family of *Lamellibranchiata*. This family comprises the genera *Vulsella, Malleus, Perna, Crenatula, Inoceramus, Catellus, Pulvinites, Gervillia*, and *Avicula*. [Avicula; Malleacea.]

MARGARITIC ACID. When eight parts of castor oil are saponified by two parts of hydrate of potash dissolved in four parts of water, by heating them together for some minutes the oil is rendered completely soluble in water. MM. Bussy and Lecanu have discovered in this soap three different fatty acids, the *margaritic, ricinic*, and *elaiodic*, which are obtained by saturating the base with hydrochloric acid. These acids form a reddish yellow oil, which at a temperature of about 60° Fahr. deposits a small quantity of solid matter, which is the margaritic acid. This is to be pressed between folds of blotting-paper, then dissolved in boiling alcohol, from which it separates on cooling in pearly scales which redden litmus paper. This acid fuses at about 270° Fahr.; its saline compounds, which however are but little known, are called *margaritates*. According to Bussy and Lecanu hydrated margaritic acid is composed of—Hydrogen, 10·91; Carbon, 70·50; Oxygen, 18·59.

MA'RGARON, a solid white fatty matter which crystallizes in pearly scales, and is obtained by distilling margaric acid with excess of lime. It fuses at about 170° Fahr., is volatile, soluble in fifty times its weight of hot alcohol, and five times its weight of boiling æther. Exposed to the action of heat in close vessels it distils almost unchanged; it burns in the air with a brilliant flame. Nitric acid acts but slightly upon it; sulphuric acid chars it, and sulphurous acid is given out. The alkalis do not act upon margaron.

This substance is composed of—Hydrogen, 13·42; Carbon, 83·37; Oxygen, 3·21.

MARGATE, a seaport town on the coast of Kent, in the parish of St. John, hundred of Ringslaw, and Isle of Thanet, 40 miles east-north-east from Maidstone, and 65 east from London (direct distances). Its name is probably derived from Meregate, signifying an opening or gate into the sea. Hasted, in his 'History of Kent,' published in 1799, says, 'The town of Margate was till of late years a poor inconsiderable fishing-town, built for the most part in the valley adjoining the harbour, the houses of which were in general mean and low; one dirty narrow lane called King Street having been the principal street of it.' At present the principal streets of Margate are regularly constructed and well paved, and lighted with gas; and many of the houses and public buildings, including an esplanade, squares, &c., are of a superior description. The spring-water is excellent and the supply abundant. The shore is well adapted to sea-bathing, and to this circumstance, added to the generally acknowledged salubrity of the air, and the facility of communication with the metropolis by means of steam-vessels, must be attributed the rapid increase in the population of the parish of St. John, which in 1831 amounted to 10,339. A handsome new church has been built at Margate within these few years. There is an hospital, called Draper's Hospital, founded in 1709 by Michael Yoakley, a member of the Society of Friends, for the housing and maintenance of decayed housekeepers. The sea-bathing infirmary at West-Brook, near Margate, was established by the benevolent Dr. Lettsom in the year 1792, assisted by committees which had been formed both in London and Margate. The object of the founders was to enable poor people to participate in the advantages of sea-bathing. The building consists of a centre building and two wings, and contains wards for the reception of nearly one hundred patients. The national school affords gratuitous instruction to about 400 children of both sexes.

The present stone pier was erected under the superintendence of Messrs. Rennie and Jessop, at an expense exceeding 100,000*l*. It is 900 feet long, and at its extremity is the lighthouse, built from a design of Mr. Edmunds. The erection of this pier has added greatly to the utility of the harbour, which is much exposed to winds from the north-east.

Margate is within the jurisdiction of Dover, one of the Cinque-ports. In the year 1787 the inhabitants thought their town of too much importance to be longer subjected to this jurisdiction, and accordingly applied to the crown for a charter of incorporation; but upon the case being heard before the attorney-general, the opposition of Dover was so strong that their petition was refused, and since then the application has not been renewed. [Cinque Ports.]

(Hasted's *Hist. of Kent; Beauties of England and Wales; Population Returns.*)

MARGINELLA. [Volutidæ.]

MARGINO'PORA, a genus of Milleporæa.

MARIA THERE'SA, archduchess of Austria, queen of Hungary and Bohemia, and empress of Germany, born in 1717, was the eldest daughter of Charles VI. of Austria, emperor of Germany. [Charles VI.] In 1724 Charles by his will, known by the name of the Pragmatic Sanction, regulated the order of succession in the family of Austria, declaring that, in default of male issue, his eldest daughter should be heiress of all the Austrian dominions, and her children after her. The Pragmatic Sanction was guaranteed by the diet of the empire, and by all the German princes individually, and also by several other powers of Europe, but not by the Bourbons.

In 1736 Maria Theresa married Francis of Lorraine, who, by the peace of Vienna of the preceding year, had been recognised as the future grand-duke of Tuscany, after the death of Gian Gastone, the last offspring of the house of

Medici. Gian Gastone died in July, 1737, and Tuscany became subject to Francis, who, in January, 1739, repaired to Florence with his consort. Upon the death of Charles VI., in 1740, the king of Prussia, the elector of Bavaria, the elector of Saxony, France, Spain, and the king of Sardinia, agreed to dismember the Austrian monarchy, to parts of which each of those powers laid claim. Maria Theresa however, with a spirit and decision remarkable for her age, lost no time in repairing to Vienna and taking possession of Austria, Bohemia, and her other German states; she then proceeded to Presburg, took the oaths to the constitution of Hungary, and was solemnly proclaimed queen of that kingdom in 1741. Frederic of Prussia offered the young queen his friendship on the condition of her surrendering Silesia to him, but she resolutely refused, and Frederic invaded that province. The elector of Bavaria on his part, assisted by French auxiliaries, invaded Austria and Bohemia, and pushed his troops to the gates of Vienna. Maria Theresa being obliged to quit her capital, repaired to Presburg. Convoking the Hungarian diet, she appeared in the midst of that assembly with her infant son Joseph in her arms. She told the magnates, prelates, and deputies, that 'being assailed by enemies on every side, forsaken by her friends, and finding even her own relatives hostile to her, she had no hopes except in their loyalty, and that she had come to place under their protection the daughter and the son of their kings.' This heart-stirring appeal was answered by a burst of chivalric enthusiasm. The Hungarian nobles, drawing their swords, unanimously cried out, 'Moriamur pro Rege nostro Maria Theresa,' and the whole military force of Hungary was soon in arms to defend their queen. Her troops under General Kevenhuller and Prince Charles of Lorraine, her brother-in-law, fought gallantly, and drove the French and Bavarians out of the hereditary states. In the meantime Charles Albert, elector of Bavaria, was elected emperor of Germany, by the diet assembled at Frankfort, by the name of Charles VII.

Frederic of Prussia soon made peace with Maria Theresa, who was obliged to surrender Silesia to him. She also made not only a peace but a treaty of alliance with the king of Sardinia against the French and Spaniards, who were kept in check on the side of Italy. In 1743 the French were entirely driven out of Bohemia. In 1744 Frederic again declared war against Maria Theresa, and invaded Bohemia: but the elector of Saxony, who had made his peace with her, sent the queen reinforcements which obliged the Prussians to evacuate the country. In 1745 Charles VII. died, and Francis, Maria Theresa's husband, was elected emperor. In 1746 the Austrian and Piedmontese troops obtained great advantages in Italy; they gained the battle of Piacenza against the French and Spaniards, and occupied Genoa, which however they afterwards lost through a popular insurrection. In 1747 the war continued to rage in Italy and Flanders, with various success. In 1748 the peace of Aix-la-Chapelle terminated the war called 'the war of the Austrian succession,' and Maria Theresa was left in peaceful possession of all her hereditary dominions, except Silesia, which the king of Prussia kept.

In 1756 began the Seven Years' War, between France, Austria, and Russia on one side, and Frederic of Prussia on the other. [FREDERIC II.] It ended in 1763, leaving both Austria and Prussia with the same boundaries as before. In 1765 Maria Theresa lost her husband, for whom she continued to wear mourning till her death, and her son Joseph was elected emperor. [JOSEPH II.] She however retained in her hands the administration of her dominions, and devoted all her cares to promote their prosperity and to the improvement of the people under her sway.

The only act of Maria Theresa's political life with which she can be reproached is her participation in the first partition of Poland. The plan however did not originate with her, and she for some time refused to accede to the treaty of partition drawn up by Prussia and Russia in 1772, until she was plainly told that Russia and Prussia would effect the dismemberment of Poland without her consent, and that by refusing to accede to it she would only endanger her own dominions. Prince Kaunitz and her own son Joseph II. urged her to join the two other powers; she was told that Gallicia and other parts of Poland were antient dependencies of the crown of Hungary, and at last she gave her assent.

The improvements which Maria Theresa made in her dominions are many and important. In 1776 she abolished the torture in her hereditary states, and in the kingdoms of Hungary and Bohemia. In 1777 she abolished the rural and personal services which the peasants of Bohemia owed to their feudal superiors, and commuted them for a sum of money. Literary piracy was forbidden under severe penalties. Between the years 1774-8 she occupied herself with the establishment of a general system of popular education in her dominions. She divided the schools into three classes: 1, 'normal schools,' one in each province, to serve as a model for all the other schools in the province; 2, 'principal schools,' in the large towns; 3, 'communal schools,' in the small towns and villages. A director had the superintendence of the normal schools; those of the large towns were under the superintendence of a magistrate; and the communal schools under the parish priest and an assessor of the communal council. A central commission of studies was also appointed to superintend the whole, which received annual reports, and examined candidates for the masterships. Maria Theresa also suggested the addition of manual labour to intellectual instruction in the communal schools. She promised an extra remuneration to those teachers whose wives taught the girls sewing, knitting, spinning, &c. This plan answered extremely well, especially among the peasantry of Bohemia. Little girls thus taught were able to earn as much as half a florin a day. This was the beginning of that system of popular education which has since been extended through the Austrian monarchy.

Maria Theresa was a pious woman: she was a sincere Roman Catholic, but not a blind devotee of the court of Rome, and she knew how to discriminate between the temporal and spiritual jurisdictions. In her instructions to the Junta, or Board of Public Economy, dated June, 1768, she states the principle that 'everything which is not of divine institution is subject to the supreme legislative authority of the state.' Agreeably to this principle she made several important reforms in the temporalities of the clergy: she suppressed the pensions charged at Rome upon benefices; she forbade the alienation of landed property in favour of ecclesiastical bodies; she ordered all the property of the clergy to be registered; she placed the convents under the jurisdiction of the respective bishops, and in temporal matters under that of the civil magistrate. She put a check to the arbitrary power of the Inquisition, which still existed in her Italian dominions: she took out of its hands the censorship of books and gave it to a commission of civil magistrates appointed for the purpose. In Tuscany, which was administered by a council of regency in the name of her second son Leopold, she ordered that lay assessors should be joined to the inquisitors in all suits for heresy. She also took away the sbirri, or armed force, which was before under the orders of the inquisitors. The Inquisition of Lombardy and Tuscany was finally abolished under the reign of her sons Joseph and Leopold.

Maria Theresa possessed the strong affection of her Belgian subjects, and it required all the subsequent rashness of Joseph II. to detach them from their loyalty to Austria. The Belgian capitalists eagerly supplied the loans which the court of Vienna was obliged to contract during the Seven Years' War.

In Lombardy the administration of Maria Theresa and of her minister Count Firmian was a period of returning happiness for that fine country, after the vicissitudes of the preceding wars and the previous long misrule of the Spanish governors. The empress ordered a new censimento, or valuation of estates, for the purpose of an equitable assessment of the land-tax; she caused the bilancio camerale, or a regular budget of the public revenue and expenditure, to be made; she abolished the custom of farming the various branches of the indirect duties to the highest bidder, made regulations to protect the peasants against the oppression of their feudal superiors, and established representative communal councils to superintend the local expenditure; she began, in short, and effected to a considerable extent, that great legislative and administrative reform which was completed under her successor Joseph II. Firmian encouraged men of learning, and protected them against the cabals of their enemies. Pietro Verri was made counsellor and president of the financial board; Beccaria was appointed professor of political philosophy; Carli was made president of the council of commerce; and the advice and suggestions of these men were listened to, appreciated, and followed. The naviglio, or navigable canal of Paderno, which joins the Adda to the Martesana, was executed under Maria

Theresa. In 1749, soon after she obtained peaceful possession of Lombardy, the duchy of Milan contained 900,000 inhabitants; in 1770 the population had risen to 1,130,000.

'Lombardy,' says a liberal writer of our times, 'had never enjoyed so much happiness and tranquillity as under her reign; it is recorded to her praise that she wished to be informed of every act of the administration, that she gave free access to her presence to the humble and poor as well as to the noble and rich, that she listened benignantly to all, either granting their petitions, or, if she denied them, giving reasons for her refusal, without illusory promises or vague circumlocutions. She declared, just before her death, which happened at Vienna on the 29th November, 1780, that if anything reprehensible had been done in her name, it was certainly without her knowledge, as she had always wished the welfare of her subjects. During a forty years' reign she always showed a love of justice and truth, and she stated, as a principle of her conduct, that it is only the pleasure of alleviating distress and doing good to the people that can render the weight of a crown supportable to the wearer.' (Bossi, *Storia d'Italia*, b. vi., ch. 15.) Another merit of Maria Theresa is the propriety of her private character; her whole conduct was characterised by that decency and self-respect, united with much simplicity of manners, which is become a distinctive characteristic of the Austrian imperial family. Maria Theresa will ever rank high among illustrious women, and among those sovereigns who have been the benefactors of mankind. With her ended the house of Austria Habsburg, and at the same time began the present dynasty of Austria Lorraine.

Frederic II. appeared really affected when he heard of the death of Maria Theresa. Writing to D'Alembert, he said that 'although he had made war against her, he had never been her personal enemy; that he always respected her, and that she was an honour to her sex and the glory of her throne.'

MARIA'NA, JUAN, was born at Talavera in 1536. He early showed great talents, which were developed under the eminent teachers of the university of Alcalá, such as Father Cyprian of Huerga and others.

At the age of seventeen Mariana joined the Jesuits, who had already acquired a reputation which attracted to them the ablest students. He had to pass two probationary years at Simancas, under Saint Francis of Borja, the hereditary duke of Gandía, and favourite of Charles V., who had renounced the world to join the new order. After this probation Mariana returned to Alcalá to resume his studies. In 1568 he was appointed to a professorship by Laynez, the second general of his order, who framed the rules of the Jesuits, raised their aspirations, prepared them for the influence which they afterwards exercised, and opened their splendid college 'Il Gesu,' at Rome.

In this college Mariana, at the age of twenty-four, taught scholastic philosophy and divinity. Among his pupils was the young Jesuit (afterwards cardinal) Bellarmin. Mariana was sent in 1565 to open a course of divinity in Sicily, and thence to Paris two years after on the same mission, in which he was still more successful. Seven years of unremitting application in an uncongenial climate so greatly impaired Mariana's health, that he was permitted to retire to Toledo, near his birthplace. But his talents and moral worth were still put in requisition. He restored and edited the works of Saint Isidore, to which he added some valuable notes. When Leon de Castro questioned the orthodoxy of Arias Montano, for introducing Rabbinical readings and commentaries into the 'Plantina Regia,' or 'Philippina Polyglott,' a new edition of the 'Complutensis,' which Montano had undertaken at the command of Philip II., Mariana silenced the noisy polemic by his historical, ecclesiastical, and biblical lore, as well as by the fair and candid tone of his discussion.

In the mean time he proceeded during his leisure hours with the great work which he had long contemplated. He had observed that the sudden rise and ascendency of Spain excited a general interest and curiosity abroad, while its origin and causes were either unknown or misunderstood. The Spanish historians, though numerous, were at that time little read, and some of them were hardly known. His 'History of Spain' first appeared in twenty books, under the title 'Historiæ de rebus Hispaniæ,' fol., Toleti, 1592, libri xx. It was subsequently extended to thirty books, in which form it appeared in the complete edition of 1605, published at Mainz. This compact and lucid exhibition of an unbroken chronological narrative, from the origin of the Spanish nation to the death of Ferdinand the Catholic (a period of twenty-five centuries at least), embraces the history of all the Spanish kingdoms, which had hitherto been treated separately. A subject so extensive, expressed in classical Latin, met with universal favour and acceptance. A Spanish translation soon became necessary, and fortunately Mariana accomplished the task himself, and carried the work through four successive Spanish editions in his lifetime.

Mariana has been charged with credulity; but traditions held sacred in times past, although rejected in the present age—prodigies which formed part of history, and which Mariana could not dismiss with the disdainful smile or the ready presumption of modern criticism, are spots which will never obscure the brilliancy of his digressions on the most important events of the world, events which appear as great causes when so admirably interwoven with those peculiarly belonging to the history of Spain.

The manly feelings of the historian, his noble indignation against crimes, his bold exposure of the misdeeds of princes and their abettors, deserve still higher commendation. Yet he, as well as Ferreras and Masdeu more recently, has spared a gross instance of Queen Urraca's licentious conduct; but on the other hand, the defence of Queen Blanca's honour is highly creditable to Mariana. It is true also that Mariana did not always examine all the original authorities, as Ranke observes in the 'Kritik neuerer Geschichtschreiber;' but to institute an inquiry into every minor detail, to comprehend a wide field of inquiry, and yet to open new and to disdain all trodden paths, would have required the perusal of whole libraries, and a single life would not have been sufficient to complete the undertaking. And if others had been invited to join in the labour of the investigation, a motley compilation might have been the only result of so much research, which it is almost impossible ever to combine into one harmonious whole. Mariana's portraits of lords and favourites were found too original and faithful by the living; as in the case of the Condestable of Castile, Ferdandez Velasco, and his worthy secretary Pedro Mantaono. The secretary, after having been a panegyrist of the new historian, tried to serve his master by his attack on Mariana, entitled 'Advertencias á la Historia de Mariana.' He was discovered however, and roughly treated by Tamayo Vargas in 'La Defensa de Mariana.' Probably to this criticism may be traced many improvements in Mariana's second Spanish edition of his history, which appeared at Madrid, 1608. It is on this edition and the various readings selected from the editions of 1617 and 1623, that the edition of Valencia is based, which contains ample notes and illustrations, 9 vols. 8vo., 1783-96. This edition also closes, like the original, with the reign of Ferdinand the Catholic (1515-16). There has subsequently been published at Madrid—1, The continuation of Mariana, by Miñana, translated from the Latin, by Romero, fol., 1804; 2, A complete Mariana, continued down to the death of Charles III., 1788, by Sabau y Blanco, 20 vols. 4to., 1817-22; 3, Another by the same, brought down to the year 1808, 9 vols. 8vo., with portraits.

Mariana's little respect for potentates and great personages was denounced with greater asperity when his 'De Rege et Regis Institutione' appeared in 1599. By his attempt on the life of Henri IV., in 1594, Jean Chatelet, who had studied among the Jesuits, not only involved the whole body in the odium of his crime, but provoked a decree for their expulsion from France. Finally the assassination of Henri, in 1610, which was supposed to have been instigated by the Jesuits, excited such horror, that the parliament of Paris condemned the new tract of Mariana to the flames; and his treasonable doctrines, as they were called, continued during the whole of that age of loyalty and part of the following to furnish a common subject of animadversion and a chief ground of accusation against the Jesuits. The Jesuits have indeed occasionally supported the claims of the people against their rulers, but always with a view to the interests of their own body only. Mariana, on the contrary, discussed this subject on better and higher grounds. Mankind occupied his thoughts, and had a much stronger hold on his affections than the interests and plans of his order. By his defence of Arias Montano, already mentioned, he lost all chance of preferment, which however he was glad to exchange for learned leisure and the gratification of his love of historical research. Mariana published also, in 1599, his imperfect work, 'De Ponderibus et Mensuris,' a subject which his countrymen Lebrija or Nebrija, Diego Covarrubias, Pedro Ambrosio Morales, and Arias Montano, had treated before, and which Eisenschmidt, Freret, Paucton, &c., have pursued much further since.

The noble character and the profound erudition of Mariana are also displayed in his 'Tractatus Septem,' Cologne, 1609. The second of these treatises, 'De Editione Vulgatâ,' is an epitome of his report on the fierce controversy between Arias Montano and Leon de Castro. The fourth, 'De Mutatione Monetæ,' provoked the indignation of the duke of Lerma and his partners in the system of general peculation and frauds which Mariana exposed. He foretold the calamities which threatened the Spanish nation; and his words, which had been disregarded, were remembered when the opportunity was gone. As a reward for proclaiming such unwelcome truths, at the age of 73 he suffered a whole year of judicial trickery, humiliations, and confinement in the convent of St. Francis at Madrid. In searching his papers another exposure was found, entitled 'Del Gobierno de la Compañía,' or on the defects of his order, in which he also pointed out the means of correcting them. Copies of this MS. had multiplied so alarmingly, that, the year after the author's death, the general of the Jesuits, Vitaleschi, issued a circular, dated Rome, July 29, 1624, enjoining the collection of such papers in order to be burnt. Still that measure did not prevent its being printed at Bordeaux in 1625, and reprinted elsewhere in several languages. This curious circular was found in the archives of the Jesuits of Valencia at the time of their sudden expulsion from the Spanish dominions in 1767; a blow which helped to complete that downfal against which Mariana had most earnestly warned his brethren so long before.

After his persecution he made an epitome of the 'Bibliotheca' of Photius, translated some homilies, revised his 'History of Spain,' and published a supplement, or rather a summary, or concise annals of Spain from 1515 to 1612. At the age of eighty-three he published his 'Scholia' on the Old and New Testament, availing himself of the best Hebrew commentaries, and some valuable and very early MSS. which dated from the age of the antient Gothic dominion in Spain. This work secured for him a place among the best commentators in the 'Histoire critique du Vieux Testament' of the hypercritical Father Simon, who is usually unfavourable to Spaniards.

Bayle, in his 'Dictionary,' supposes Mariana to be also author of a work 'De Republicâ Christianâ,' but neither Alegambe nor Nicolas Antonio, both of them Spaniards, mentions it. Stevens, the English translator of Mariana's history, misstates some particulars of the author's life, and very unaptly compares him with Raleigh.

Mariana left MSS. of at least twice the extent of all his publications. He ended a long life, almost entirely devoted to the service of his own and future generations, on the 6th of February, 1623, in the eighty-seventh year of his age and the forty-ninth of his retirement to Toledo. On hearing of his death, the illustrious Francis Contreras, president of the council of Castile, said, 'To-day has the council lost its restraint.'

Besides the authorities quoted there may be added:—Mondejar, *Advertencias á Mariana; Juicio y Noticia de los Historiadores de España;* Andrade, *Vida de Mariana;* Acosta, *Vida de Mariana;* Andr. Schot., *Hispan. Illustrat.;* Baronius, *Annal. Ecclesiast.;* Bernard. Girald., *Pro Senatu Veneto,*' quoted in Colomesius, *Hispania Orientalis;* René Rapin, *Reflexions sur l'Histoire.*

MARIE ANTOINETTE, born at Vienna, in November, 1755, was the daughter of Francis of Lorraine, emperor of Germany, and of Maria Theresa of Austria. In May, 1770, she married Louis, the dauphin, grandson of Louis XV., who in 1774 became king of France, under the name of Louis XVI. She was handsome, lively, and thoughtless, but kind-hearted and with good intentions. She disliked the etiquette and reserve of the court, but she affected, rather too ostentatiously, a taste for privacy and domestic familiarity. Although her thoughtlessness afforded a pretence for slander, her private conduct has been generally allowed to have been guiltless. When the difficulties and dissensions which produced the Revolution began, Marie Antoinette was on the side that was for making resistance; but unable to impart energy to her husband, she only led him into inconsistencies. She did not disguise her aversion to those leaders who had begun the Revolution, and would never stoop to conciliate their favour. After the national assembly had assumed the supreme power, she refused the offers of Mirabeau to support the interests of the crown, and thus drove that able but unprincipled orator back into the ranks of the revolutionists. But her influence in the councils of Louis has been much exaggerated by her enemies. Louis, naturally disposed to concession, was by temper irresolute, and he allowed himself to be led away by the course of events, instead of striving to direct them. Marie Antoinette was one of the advisers of the attempted flight of the king, which proved unsuccessful, and only served to excite the public animosity against her and her husband. After that epoch there was no longer much opportunity for her to exercise any political influence; her husband had lost all power; besides which, a strong faction supported by the armed masses had determined to do away with the kingly office altogether. Marie Antoinette showed great courage during the various attacks made against the royal family; she appeared much more anxious about her husband and her children than about herself. She shared their captivity with resignation; her demeanour, under the most trying circumstances, never lost its dignity. Adversity imparted firmness to her mind, and she exhibited a moral strength which astonished while it irritated her bitterest enemies. After the death of her husband, she seemed forgotten for a time; but the terrorist faction having overthrown the Girondins, its leaders resolved to make away with the ex-queen, an act of cruelty the more odious as it was entirely useless. They brought her to trial before the convention. She was of course found guilty, and condemned to death. In the presence of her judges her fortitude never forsook her, and the burst of indignant maternal feeling with which she appealed to the mothers who might be there present, when an infamous and absurd charge was brought against her, overawed even her accusers.

On the 16th of October, 1793, Marie Antoinette was removed in a common cart from the prison of the Conciergerie to the place of execution. On her way she was reviled and abused by the ferocious mob in the most unfeeling manner; but she appeared heedless of their vociferations, and suffered death with firmness and composure. She was forty-two years of age, but her sufferings had given her a much older appearance. She left one son, who died in prison (Louis XVII.), and a daughter, who is the present duchess of Angoulême.

Medal of Marie Antoinette.

MARIE DE' ME'DICI, the daughter of Francis I., grand-duke of Tuscany, and of the archduchess Joan of Austria, was born at Florence in 1573, and was married in 1600 to Henri IV. of France. She was handsome, and Henri was for a time really attached to her; but she was violent, jealous, and obstinate, and seldom passed a week without quarrelling with her husband. The memoirs of Sully and others contain details of these domestic bickerings. But the best historical critics acquit her of any more serious misconduct, and especially of the odious insinuation thrown out by some writers, that she was privy to the murder of her husband. Henri at that time was just going to set off for the army, and he had signified his intention to leave her regent of the kingdom. Hérault only observes that she did not show sufficient grief for the death of her husband. Mary was weak rather than wicked; she had the aspirations of ambition without corresponding mental powers; and when she became regent, during her son's mi found herself incapable of bearing the weight nistration. [LOUIS XIII.] She next quarrelled with her son, and made peace with him by means of Richelieu, whom she had introduced into the council; but she afterwards grew jealous of his great influence, and plotted against him. She was exiled, A.D. 1630; went to Belgium, England, and Germany; and at last died at Cologne, in 1642, in a state bordering upon destitution.

MARIE-GALANTE, an island in the Carribean Sea, about 15 miles south of Guadaloupe. It is of a circular form, and about 14 miles in diameter. This island was discovered by Columbus in 1493, and was first settled by the French in 1647. It has always been considered a dependency of Guadaloupe, and has uniformly followed the fate of that island when taken by any foreign power. [GUADALOUPE.] The surface of Marie-Galante is of moderate elevation, and rises gradually towards the north; the western side is flat. The soil is productive, and yields abundantly the several West Indian products; but its exports and imports having always been included in the official statements with those of Guadaloupe, we have no record of the amount of its productions. The same course has been followed with regard to other statistical details, and we are therefore unacquainted with the amount of its population. Some authorities state it to be about 10,000. The only town, Basseterre, stands on the south-west point of the island, in 15° 52′ N. lat. and 61° 22′ W. long.

MARIE-AUX-MINES, SAINTE. [RHIN, HAUT.]

MARIENBERG, a town in the kingdom of Saxony, in 50° 4′ N. lat. and 16° 45′ E. long., at an elevation of 2000 feet above the level of the sea. It has mines of silver, iron, tin, and cobalt, and produces arsenic and vitriol. The inhabitants, about 4000, besides working the mines, manufacture lace, linen, calico, &c. The silver mines were discovered at the beginning of the sixteenth century, and the town was founded in consequence in 1519 by Henry duke of Saxony. It is well built, with straight streets, a handsome market-place, a church, a gymnasium, an orphan asylum, and an institution for poor or disabled miners.

MARIENBURG, a town of West Prussia, in the government of Danzig, is situated in 54° 1′ N. lat. and 19° 2′ E. long., on the banks of the Nogat, over which there is a pontoon bridge 540 feet in length. It is chiefly celebrated as having been the seat of the Grand-master of the Teutonic Order from the year 1309 to 1466. The antient castle, and the lofty towers and parapets, which are the remains of the old fortifications, give it, when seen at a distance, a grand and striking appearance. The style of building is antient but irregular. Here and there are some more modern edifices, especially in the principal street, which however do not harmonise with the general character of the architecture. In front of the houses on both sides of the streets there is a connected line of porticos, the origin of which dates from the first building of the town in 1276 by the Teutonic knights. The remains of the palace of the Order are extremely grand, and his royal highness the crown-prince of Prussia has caused it to be repaired and partly restored to its antient splendour. The town is surrounded by a rampart, outside of which are two suburbs. There are extensive breweries and distilleries, and some manufactures of linen, woollens, leather, and cotton, but scarcely sufficient for the consumption of the town. The inhabitants carry on a considerable trade in the exportation of corn, timber, and fish, and likewise in the less important articles of quills and hogs' bristles. The population, 9000 in number, are chiefly Roman Catholics and partly Lutherans.

MARIENWERDER, one of the two governments into which West Prussia is now divided, lies between 52° 46′ and 54° 6′ N. lat., and 16° and 21° E. long., and is bounded on the north by the government of Danzig, on the east by that of Königsberg, on the south by Poland, on the south-west by Posen, on the west by Brandenburg, and on the north-west by Pomerania. Its area is 6880 square miles, and the population 460,000. The government is divided into 13 circles.

The circle of Marienwerder contains 343 square miles, with a population of 45,000.

Marienwerder, the capital, situated on the Liebe and the Little Nogat, two miles from the Vistula, over which there is a pontoon bridge 2700 feet in length, has 5500 inhabitants. It is a very neat town, with four suburbs, and has considerably increased during the present century. It is the seat of the provincial courts and the government offices. There are manufactories of woollens, hats, soap, and leather. The breweries and distilleries are very considerable.

MARIENZELL, or MARIAZELL, a small town in Upper Styria, the most celebrated place of pilgrimage in the Austrian dominions, is situated on a low hill in the middle of an extensive valley. It consists of only three streets, with 120 houses, of which nearly 50 are inns and taverns, and the population does not exceed 1000. The most considerable edifice is the church, built in the Gothic style, in which is the famous statue of the Virgin Mary, which was brought here 700 years ago. Princes and nobles rivalled each other during many centuries in bestowing the most costly gifts upon the church, and its treasury contained immense riches, which however have been greatly diminished in modern times by various accidents, especially by the great fire in 1827, when the whole town, except nine houses, was reduced to ashes. The roof and the steeple of the church were destroyed, but the treasury and the statue of the Virgin Mary were saved. It was however necessary to sell a great part of the treasures in order to repair the church, which is now more splendid than ever. The number of pilgrims that resort thither from all parts of the Austrian monarchy is estimated at 100,000 every summer. Under the reign of the emperor Joseph II., all processions of pilgrims, and particularly those to Marienzell, were prohibited, but were again permitted in 1796 by the emperor Francis. The procession, in 1819, consisted of about 12,000 pilgrims, who, being handsomely dressed in the costume of the several provinces from which they came, presented a striking and interesting appearance.

MARIESTAD. [SWEDEN.]

MARIKINA. [MIDAS.]

MARIMONDA. [ATELES, vol. ii., p. 547.]

MARINE INSURANCE. The general principle upon which insurances are made, whether of property against the chance of fire, of human life against the accidents or contingencies of mortality, or of ships and their cargoes against the multiplied risks to which they are exposed, is the same: viz. that of reducing to each individual in every case, his possibility of loss down to the average loss of a great number of individuals or cases. Marine insurances differ however from fire and life insurances in the mode of conducting the business, as well as in the diversified nature of the risks against which security is sought. The chief of these in time of peace include the chances of fire, of piracy, of barratry of the master or crew, *i.e.* the running away with the vessel by these parties, as well as the more ordinary mischances resulting from storms, sunken rocks, fogs, and the like. To these are superadded, in time of war, the chances of capture by an enemy, and all restraints of foreign princes or governments.

Until a recent period nearly all the marine insurances effected in London, which is the great emporium of such business, were made with individuals who became answerable for comparatively small portions of the sum insured, differing thus from other kinds of insurances where the whole risk was taken by a joint-stock association. Until 1824 it was not lawful for any two or more individuals, with the exceptions that will be mentioned, to combine together for taking upon themselves sea-risks, and all the business of this kind transacted in London was undertaken by a class of persons called underwriters, from the mode employed of binding themselves to the conditions of the contract by writing their names and the sums which they assured under the deed in which these conditions were set forth. The exceptions to the limitation of partnership, just mentioned, were made in favour of two chartered joint-stock companies, the Royal Exchange and the London Assurance companies. Endeavours were made at various times to alter the law in this respect, and were always successfully resisted on the part of the underwriters until 1824, but since that time it has been lawful for any number of persons to associate themselves together for undertaking marine insurances, and many joint-stock companies for that purpose have been formed and put in action with advantage to the public. Before the year 1824, several insurance clubs, which were in fact mutual insurance associations, existed and were considered legal. In those there was no payment made of premium, but each member of the club was periodically called upon to pay a proportion of the losses sustained by the members of the club generally, the rate of his contribution being made to depend upon the value of the property, in respect of which he might have sustained loss, that would have been made good to him. These clubs, which still exist, are usually confined to persons engaged in particular branches of trade, such as the coal-trade of the North of England, where the risks incurred by the different members are generally equal in degree, a condition which is necessary in order to render the association equitable.

The policy, or contract of insurance, must contain the name of the ship, when known, and of the master, with the nature of the voyage, and must describe also in good faith any circumstances which are out of the ordinary or understood course in similar risks or voyages, such as any contemplated deviation from the route usually followed. The business of effecting insurances is sometimes done by the merchants or owners of the ships or goods insured, but more frequently through the agency of insurance-brokers, whose remuneration comes from the underwriters or insurance-offices, as the case may be, and not from the assured, their employers. That remuneration consists in an allowance of 5 per cent. on the amount of the gross premium in each case, and in a further allowance of 12 per cent. upon the net amount of premiums paid by them to the underwriters or offices at the end of the year, after deducting all losses and averages recovered for the assured.

The policy of insurance, when underwritten by the assurer, bears a declaration of the amount of premium having been paid, but in practice that payment is not made until some months after the expiration of the current year in which the risks are taken, unless in the case of a total or partial loss, when all premiums outstanding upon the account of the merchant or broker, as the case may be, are allowed as a set-off against the amount of the loss. Where a broker is employed, the underwriters give credit to him, and not to his employers, for the amount of premiums, and they have recourse for the same only to the broker. As some compensation to the broker for the 12 per cent. allowance above mentioned, which he foregoes in the event of a loss, he makes a charge against the merchant by whom he is employed of ten shillings for every hundred pounds upon the amount recovered.

The rate of premium varies of course with the nature of the voyage, the period of the year, and the quality of the ship. As regards this latter point the underwriters and managers of insurance companies are enabled to judge with great accuracy by means of a register kept under the superintendence of a committee of merchants and underwriters, in which every necessary particular concerning every mercantile ship is inserted from the surveys of competent officers appointed for the purpose, who are paid certain fees for their trouble by the owners. This register is of as much importance to the shipowner as it is to the underwriter. If the quality of the vessel is seen to be good, the charge made for premium of insurance is less than where that quality is bad or doubtful; and in the event of loss it gives readier means for rebutting the charge of unseaworthiness than might otherwise be found, such a charge, when proved, being held in law to exonerate the underwriter from payment of the loss.

The losses for which underwriters are liable are either total or partial. In some cases it may happen that the claim upon an underwriter exceeds the amount of his subscription, as where a ship meets with damage, and after quitting a port where she has been repaired or refitted, is wrecked or otherwise lost. The claim in such cases would be not only for the amount expended in repairs, but also for the value of the ship or goods, when lost. Partial loss or damage is called an average loss, and averages again are divided into the two classes of general average and particular average. Under the first of these heads are included all losses of a part of the property voluntarily incurred for the preservation of the remainder. If a ship is thrown on her beam ends, and to right her the masts are cut away, this constitutes a general average, and the loss must be borne in shares proportionate to their value by the owners or insurers, as the case may be, of the ship and the cargo. So if a ship lying at anchor should be in danger of dragging her anchor, and so going on shore, and the cable should be cut, or if to lighten her in a storm part of her stores or cargo should be thrown overboard, this would constitute a general average, and must be met by the owners or insurers of the whole property as before described. Particular average arises when the ship or the cargo meets with damage from any of the chances against which insurance is provided, but which is not incurred voluntarily and to prevent a greater loss. In these cases the damage must be made good by the insurer of the ship or of the goods which are damaged, and not by a general contribution from all. Where this partial damage happens to the ship it is usual for the underwriters to reinstate the same, paying two-thirds only of the cost, it being considered that the owners of the vessel will benefit to the extent of the remaining one-third by receiving new articles in place of those in use which have been lost, or by the better state in which the vessel will be placed by the repair. Goods which are peculiarly liable to damage, either from their nature or from the manner in which they are packed, are not entitled to claim particular average except the ship be stranded, or except the damage shall exceed a certain per centage of the value. Corn, seed, flour, fish, salt, and fruit are not liable to particular average, whatever be the amount of damage, except the ship be stranded; and sugar, tobacco, hemp, flax, hides, and skins are warranted by the assured free of particular average, unless the damage should amount to five per cent. or more of their value, with the like exception as regards stranding.

It is not possible to give within reasonable limits more than a very general view of the law and practice connected with marine insurances, concerning which many volumes have been published.

Policies of insurance on sea risks are liable to stamp duties, which vary according to the nature of the voyage and the rate of the premium, viz.:—

On coasting risks where the premium does not exceed 20*s.* per cent. the stamp duty is 1*s.* 3*d.* per cent.; and where the premium exceeds that rate it is 2*s.* 6*d.* per cent. On foreign risks, where the premium is not higher than 15*s.* per cent., the duty is 1*s.* 3*d.* per cent.; when the premium is between 15*s.* and 30*s.* per cent. the duty is 2*s.* 6*d.* per cent.; and when the premium exceeds 30*s.* the duty is 5*s.* per cent.

Vessels engaged in voyages of long duration, such as the South Sea whaling-ships, or vessels employed in a particular line where the risk is unvarying, are sometimes insured for a specific time. The stamp duty in such cases is 2*s.* 6*d.* per cent. for a period not exceeding three months, and 5*s.* per cent. between three months and twelve months, but no time risk for a longer period than twelve months can be covered by the same stamp, and a new policy must then be taken out.

MARINER'S COMPASS. [Compass, Mariner's.]

MARINES, men embodied to serve as soldiers on board of ships of war in naval engagements; and on shore, in the event of a descent being made upon an enemy's coast. In the British service, they also assist occasionally in performing some of the operations connected with the working of the ship; they cannot however be sent aloft at the command of a naval officer.

Originally in this country, as well as in France, the national fleets were composed of merchants' ships, which were armed on occasion for war; and then there were no soldiers particularly destined for the naval service. The first troops of this kind in France were men skilled in the practice of the useful trades, who, when unemployed by the government, lived on shore on half-pay; receiving only the full pay when called upon to serve at sea. This regulation did not however long subsist; and, subsequently to the administration of Cardinal Richelieu, companies of marine soldiers have been constantly retained on full pay.

It is not precisely known at what period distinct corps were appointed, in Britain, to this branch of the public service. In 1684 mention is made of the duke of York's maritime regiment of foot; and in the reign of William III. several regiments were placed on the establishment of the navy, but these were subsequently disbanded. At that time the marine soldiers seem to have been retained as persons in training to become good seamen; and, in Burchet's 'Naval History,' quoted by Grose ('Mil. Antiq.,' vol. i.), it is said that they were discharged from the regiments and entered on the ship's books as foremast-men as soon as they became qualified to serve as such.

In the beginning of Queen Anne's reign (1702), six regiments of maritime soldiers were raised; and among the regulations concerning their service it is stated that they were to be quartered, when on shore, near the principal seaports. Whether at sea or on shore, they were to be paid at the same rate as the land forces, and the same deduc
were to be made for clothing. At sea they were to be
provisions equal in every respect to the shares of the
without suffering any diminution of pay on that acc

In 1749, the then existing regiments of marine soldiers, ten in number, were disbanded; and six years afterwards, on the recommendation of Lord Anson, there were raised 130 companies, consisting in all of above 5000 men, who were put under the immediate command of the lords of the admiralty, and whose head-quarters were appointed to be at Plymouth, Portsmouth, and Chatham. The corps of marines, as it was then called, has subsequently been considerably increased; in 1759 it numbered 18,000 men; and during the late war its strength amounted to about 20,000 men. An additional division was, by an order of council in 1805, established at Woolwich; and there are two companies of marine artillery, whose head-quarters are at Portsmouth.

The marines are now clothed and armed in the same manner as the infantry of the line, and, like all the other royal regiments, their scarlet uniform has blue facings. In an engagement at sea, they annoy the enemy by a fire of musketry from the tops and deck; and they repel with the bayonet any attempt to board the ship. The gallant *jollies*, as the marines are familiarly called, have often distinguished themselves when acting on shore; and their meritorious services at the taking of Belleisle (1761), in the battle of Bunker's Hill (1775), in the defence of Acre (1799), and very recently, under Lord John Hay, on the coast of Spain, have earned for themselves a lasting reputation.

The royal corps is commanded by a lieutenant and a major-general, who are naval officers holding, in addition to their rank as such, those military titles. There are also four colonels-commandant of divisions, besides four colonels and second commandants. No commissions in the corps are obtained by purchase; and the officers of marines rise in it by seniority, as high only however as the rank of colonels-commandant.

MARI'NO, SAN. [San Marino.]

MARIOTTE, EDME. Little is known of his life. He was a Burgundian born, a priest by profession, and resided in the earlier part of his philosophical career at Dijon. He was afterwards prior of Saint Martin, near Beaune, and died May 12, 1684, having been one of the first members of the Academy of Sciences. See the éloge by Condorcet, vol. i., p. 74, of his collection.

Several of the writings of Mariotte were published by himself, and one or two more after his death. Those of the former class were several times reprinted, and the whole were finally collected under the title 'Œuvres de Mariotte,' in two volumes quarto, Leyden, 1717. Another edition (perhaps the same with a new title) was published at the Hague, in 1740. This collection contains treatises on percussion, on vegetation, on the nature of the air, on heat and cold, on the nature of colours, on hydraulics, on some phenomena connected with sight, on levelling, on the motion of the pendulum, on the congelation of water, and on the logic of the sciences.

Condorcet says of Mariotte, that 'he was the first Frenchman who carried with him into experimental philosophy a spirit of observation and doubt, and inspired others with that caution and timidity which are so necessary to those who interrogate nature and undertake to interpret her responses.' His writings, though more connected with mathematical deduction than those of Robert Boyle, somewhat resemble them in the miscellaneous character of the experiments with which they are crowded.

The principal results by which the name of Mariotte is known to a reader of modern works are the following:—

1. He was the discoverer of that law of elastic fluids which now goes by his name; that is, of the elastic force being exactly in the inverse proportion of the space which a given mass of fluid occupies. Subject to such alterations as difference of temperature may require, the formula derived from this law is now one of the fundamental parts of aerostatics.

2. He discovered that air, and air in a state of condensation, exists in liquids.

3. He found that the part of the retina in which it meets the optic nerve is not capable of conveying the impression of sight.

Among minor matters, we may mention the now common guinea and feather experiment, which he first made with the air-pump.

MARITIME LAW. [Admiralty Courts; Shipping.]

MARITZA, the modern name of the Hebrus, the principal river of Thrace. The basin of the Hebrus is enclosed between the chain of Hæmus, or the Balkan, on the north, and Mount Rhodope, the modern Despoto, on the south; the first divides it from the basin of the Danube, and the other from that of the Strymon. [Amphipolis.] The Hebrus rises at the foot of Mount Rhodope, in about 42° N. lat. and 24° E. long., and flows in an easterly direction for more than 100 miles, receiving numerous affluents from both chains of mountains: it passes by Tatar Bazardjik, Philippopolis, and Chirmenli (the antient Assus), where it diverges to the south-east until it reaches Adrianople, where it is joined by two large streams, the Toonja, or Tonzus, from the north, and the Arda, or Harpessus. After passing Adrianople the Hebrus turns to the south, receives the Erkeneh (the antient Agrianes), coming from the direction of Constantinople, flows by Demotica, and, after numerous windings, enters the gulf of Ænos by two mouths, opposite the island of Samothrace. The whole course of the Hebrus is above 300 miles. It is navigable for small craft as far as Adrianople, about one-third of its course.

MA'RIUS, CAIUS, was born of humble parents, at or in the neighbourhood of Arpinum, about B.C. 157. He served at the siege of Numantia, B.C. 134, under Scipio Africanus, together with Jugurtha, where he highly distinguished himself. He received great marks of honour from Scipio, who used frequently to invite him to his table; and when, one evening at supper, Scipio was asked, where they should find so great a general when he was gone, he is said to have replied, placing his hand upon the shoulder of Marius, 'Here perhaps.'

In B.C. 119 he was elected tribune of the plebs, through the influence of Cæcilius Metellus, according to Plutarch, but more probably in consequence of the fame he had acquired in the Numantine war. In this office he showed himself, as he did throughout the whole of his life, a most determined enemy to the patrician order, and one who was not easily to be put down by the threats and opposition of his enemies. Having proposed a law to prevent illegal voting at elections, the senate passed a decree that the law should not be put to the vote in the popular assembly, and summoned Marius before them to answer for his conduct. Marius not only appeared, but threatened to commit the consuls to prison, if they did not repeal the decree; and when Metellus continued to support it, he commanded him to be led away to prison.

Marius obtained the prætorship with great difficulty. in consequence of the violent opposition of the patrician order, who accused him of having obtained the office by means of bribery. At the expiration of his prætorship the province of Spain was assigned to him, which he cleared of robbers. On his return to Rome, he was anxious to obtain the consulship; but he did not venture to become a candidate for many years after. He continued however to rise in public opinion, and appears about this time to have married Julia, one of the Julian family, who was aunt to the celebrated Julius Cæsar.

In B.C. 109 he accompanied Metellus into Africa in the capacity of *legatus* (second in command); and by his prudence and courage in the war with Jugurtha he added greatly to his military reputation. His friends took advantage of his increasing popularity at Rome to persuade the people that the war with Jugurtha would never be concluded until the command was given to Marius. This led to an open rupture between him and Metellus; and it was with the greatest difficulty that Metellus allowed his lieutenant leave of absence to go to Rome in order to stand for the consulship. Marius was however successful; he obtained the consulship (B.C. 107) and the command of the Jugurthine war. On his arrival in Africa, Marius prosecuted the war with the greatest vigour; and in the following year (B.C. 106) obtained possession of the person of Jugurtha, who was treacherously given up by Bocchus to his quæstor Sulla. [Jugurtha.] Marius remained in Africa during the next year (B.C. 105); in which the consul Manilius and the proconsul Cæpio were defeated by the Teutones and Cimbri in Gaul, with the prodigious loss, according to Livy (*Ep.* 67) of 80,000 soldiers, besides 40,000 camp-followers. The news of their defeat caused the greatest consternation at Rome, especially as the Teutones and Cimbri threatened the immediate invasion of Italy; and Marius was accordingly elected consul in his absence, without any opposition even from the patrician party, as the only man in the state who was able to save it from impending ruin.

Marius entered upon his second consulship B.C. 104, and triumphed on account of his victories over Jugurtha; but in consequence of the threatened invasion of Italy having been deferred by an irruption of the Cimbri into Spain, Marius was again chosen consul in the two following years (B.C. 103, 102). In the fourth consulship of Marius (B.C. 102) the Cimbri, having been defeated by the Celtiberi in Spain, returned to Gaul, and resolved to invade Italy in two divisions; the one, consisting of the Teutones and Ambrones (a Gallic people), through Gallia Narbonensis; and the other, comprising the Cimbri, by way of Noricum. Marius defeated the Teutones and Ambrones near Aquæ Sextiæ (*Aix*) in Gaul; but Catulus, who was stationed at the foot of the Alps to oppose the passage of the Cimbri, retreated first to the other side of the Athesis (Adige), and afterwards quitted this position also without waiting for the enemy's attack. In the following year, B.C. 101, Marius, who was again elected consul, for the fifth time, joined his forces with those of Catulus, and entirely defeated the Cimbri in the plain of Vercellæ (Vercelli), situated to the north of the Po, near the Sessites (Sesia). In these two battles the Teutones and Ambrones are said to have lost the incredible number of 290,000 men (200,000 slain and 90,000 taken prisoners); and the Cimbri 200,000 men (140,000 slain, and 60,000 taken prisoners). (Livy, *Ep.* 68.)

Marius again became candidate for the consulship for the following year; but now that the fear of the Gallic invasion was removed, he was opposed by the whole strength of the patrician party. He nevertheless obtained the consulship, in great part owing to the exertions of Saturninus, the tribune, who is described as a man who scrupled at the commission of no crime in order to obtain his object. The events of the sixth consulship of Marius, which are some of the most important in this period of Roman history, are imperfectly narrated by the historians. It appears that an Agrarian law, proposed by Saturninus and supported by Marius and one of the prætors named Glaucia, was carried notwithstanding the most violent opposition of the patrician party; and that Metellus Numidicus was driven into exile in consequence of refusing to take the oath of conforming to the law. When the election of consuls for the ensuing year came on, Memmius, who opposed Glaucia as a candidate for the office, was murdered by order of Saturninus; and the senate, perceiving the city to be in a state of anarchy, passed the usual decree, 'that the consuls should take care that the republic should receive no injury,' by which almost absolute power was vested in the consuls. Marius, unable or unwilling to protect his old friends, besieged Saturninus and Glaucia, who had seized upon the capitol. They surrendered themselves to Marius on the promise that their lives should be spared, but they were all immediately put to death. It appears probable that Marius, after the blow which had been given to the popular party by the surrender of Saturninus and Glaucia, would not have been able to save their lives, even if he had made the attempt.

At the expiration of his consulship, Marius left Rome to avoid witnessing the triumph of the patrician party in the return of his old enemy Metellus, whose sentence of banishment was repealed after the death of Saturninus. According to Plutarch, Marius went to Cappadocia and Galatia, under the pretence of offering a sacrifice which he had vowed to Cybele; but with the real object of exciting Mithridates to war, in order that he might be again employed in military affairs, since he did not obtain much distinction in peace.

In B.C. 90 the Marsian or Social war broke out; in which both Marius and Sulla were engaged as legati to the two consuls. Marius gained several victories over the enemy, but he no longer possessed that activity and energy which had distinguished him in his earlier years; and disgusted, it is said, with the increasing reputation of Sulla, he resigned his command before the conclusion of the war.

The Marsian war had scarcely been brought to an end, before the civil war broke between Marius and Sulla. The command of the Mithridatic war had been assigned to Sulla, who was now consul (B.C. 88); but Marius used every effort to wrest it from him, and is said by Plutarch to have gone every day to the Campus Martius, and to have performed his exercises with the young men, although he was now in his 70th year and very corpulent, in order to show that he was not incapacitated by age. He was warmly supported by P. Sulpitius, the tribune, who possessed great property and influence; and a law was eventually passed that the command should be taken from Sulla and given to Marius. Sulla was with the army at the time besieging Nola; but as soon as he heard of the law which had been passed, he marched to Rome; and Marius and his adherents were obliged to quit the city. After wandering through many parts of Italy, Marius escaped with the greatest difficulty to Africa; but he had no sooner landed at Carthage, than Sextilius, the governor of the province, sent word to him, that unless he quitted Africa, he should treat him as a public enemy. 'Go and tell him,' replied Marius, 'that you have seen the exile Marius sitting on the ruins of Carthage.' But in the following year (B.C. 87), in the absence of Sulla, who had gone to Greece to oppose Archelaus, Marius returned to Italy in order to join the consul Cinna, who, in his attempts to abrogate the laws of Sulla, had been driven from Rome by his colleague Octavius, supported by the patrician party. Shortly afterwards Marius and Cinna entered the city at the head of a large army; and a general massacre of the opposite party ensued. Marius always appears to have been of a fierce and unrelenting temper; and the sufferings he had lately undergone, which at his time of life must have greatly impaired his health, tended to exasperate him more than ever against the party which had opposed and thwarted him during the whole of his life. All the leaders of the patrician party who were unable to escape from Rome were put to death: Lutatius Catulus, who had been the colleague of Marius in the war with the Cimbri, put himself to death in order to avoid assassination; and among the numerous illustrious patricians who fell were C. and L. Julius Cæsar, and the celebrated orator M. Antonius, who is so frequently praised by Cicero, and is one of the principal speakers in the treatise 'On the Orator.'

Marius and Cinna declared themselves consuls for the ensuing year (B.C. 86), without even holding the comitia; but Marius died of a fever in the beginning of the year, on the 17th day of his consulship, according to Plutarch (c. 46), or the 13th, according to Livy (*Ep.* 80).

The character of Marius is chiefly known to us from his life by Plutarch, who appears to have taken his account from the 'Memoirs of Sulla,' the inveterate enemy of Marius. It cannot be denied that after his return from exile Marius was guilty of the greatest cruelties, but even these were surpassed by the atrocities of Sulla; and we should not be doing justice to Marius, if we ascribed to him, during the whole of his life, the character which he displayed in his seventh consulship. 'I have seen,' says Plutarch (c. 2), 'the statue of Marius at Ravenna in Gaul, which expresses in a remarkable manner his sternness and severity. Since he was naturally robust and warlike, and more acquainted with the arts of war than those of peace, he was fierce and haughty when in authority. It is said that he never learnt Greek, and that he would not make use of that language on any serious occasion; as if it were ridiculous to learn the language of a people who were subject to others. If he could have been persuaded to pay his court to the Grecian muses and graces, he would not, after bearing so many honourable offices and performing so many glorious exploits, have crowned the whole by a most savage and infamous old age, in consequence of his yielding to anger, ill-timed ambition, and insatiable avarice.'

(Plutarch's *Life of Marius*; Sallust's *Jugurthine War*; *Epitomes* of Livy; Velleius Paterculus; Cicero, *De Oratore*, iii. 2, 3; Clinton's *Fasti Hellenici*.)

MARIVAUX, PIERRE CARLET DE CHAMBLAIN DE, born at Paris, in 1688, was one of the most popular romance writers of the eighteenth century, and one to whom that branch of literature is mainly indebted for the character and authority which it has acquired as a representation of actual life and manners, illustrated by the analysis of conduct and motives, sentiments and feelings. He began his career as a dramatic writer, and his pieces were for a long time the support of the Théâtre Italien. Yet although they display much ingenuity and talent, and procured for their author a seat in the French Academy, they now possess little interest, except as being productions of the same pen which gave the world 'La Vie de Marianne,' and the 'Paysan Parvenu.' Marivaux also wrote another romance, entitled 'Pharsamon,' every way inferior to the two on which his reputation rests; also 'Le Spectateur François,' and 'Le Philosophe Indigent.' The inequality of his taste was also manifested by his 'Homère Travesti,' which was published in 1716, was neglected from the very first, and has long been deservedly forgotten; while his two novels still ch by the master-touches with which they abound, by accurate and highly finished delineations of character, and by the intimate knowledge which they display of the human heart. Marivaux was no less estimable as a man than as an author. He was not one of those who put on morality as a holiday suit when they show themselves in public; he did not, like Sterne, dip merely his pen in sentiment; nor was he, as too many others have been both before and since, the eloquent advocate of a philosophy which his own conduct belied. On the contrary, his life illustrated the lessons which he endeavoured to impress upon others. Benevolence to all, active sympathy for the unfortunate, and a philosophic indifference towards wealth and distinctions, were prominent traits in his character. He died at Paris in 1763.

MARJORAM, an aromatic potherb, used in cookery, especially among the French. It is the Origanum Majorana of Linnæus, or Majorana hortensis of Mœnch, a native of Barbary and the Himalaya mountains. In gardens it is little better than an annual; in a wild state it is a suffruticose perennial.

MARK. [Money.]

MARK, ST., the Evangelist, is supposed by the greater number of antient and modern writers to be the same person as John Mark, who is mentioned in the 'Acts of the Apostles' (xii. 12, 25; xiii. 5, 13; xv. 37). It is most probable that John was his Jewish name, and that he took the surname of Marcus when he went to preach among the Gentiles. He was the son of Mary, a pious woman at Jerusalem, in whose house the disciples were wont to meet (*Acts*, xii. 12), and the nephew of Barnabas (*Col.* iv. 10). He left Jerusalem with Paul and Barnabas, about A.D. 44 (*Acts*, xii. 25), and accompanied them in their return to Antioch, and thence in their mission (*Acts*, xiii. 5) as far as Perga in Pamphylia, where he parted from them and returned to Jerusalem (*Acts*, xiii. 13). About A.D. 53 we find him again at Antioch, when Paul proposed to Barnabas to visit the Asiatic churches. Barnabas wished to take Mark with them, but Paul refusing on account of his having deserted them in their former journey, they separated from each other, and Mark accompanied Barnabas to Cyprus (*Acts*, xv. 37-39). Paul appears to have been reconciled to him afterwards, for we find him at Rome with the apostle during his imprisonment, and he is honourably mentioned in some of Paul's Epistles (*Col.* iv. 10; *Philemon*, ver. 24; 2 Tim. iv. 11). We also find him with Peter in Asia (1 *Pet.* v. 13; see Steiger's 'Commentary on the First Epistle of Peter,' *in loco*); and it is supposed that he accompanied that apostle to Rome. According to Eusebius, Epiphanius, and Jerome, he afterwards went to Egypt, and founded a church at Alexandria, where he died and was buried, according to Jerome, in the eighth year of Nero's reign, A.D. 62. But this date appears to fix his death earlier than other circumstances in his history will warrant.

All the early writers affirm that Mark was intimately acquainted with St. Peter: Papias, Irenæus, and Tertullian call him 'Peter's interpreter.' It has been supposed that he was converted to Christianity by St. Peter, as that apostle calls him 'my son' (see Kuinoel's note on *Matt.* xii. 27). Some of the later Fathers mention him as one of the seventy evangelists; but there is no good authority for this tradition, and it is contradicted by Papias, who expressly says that he had heard from the presbyter John, who was contemporary with the apostles, that Mark was not a hearer nor a follower of Christ, but of Peter. (Eusebius, *Ecc. Hist.*, iii. 39.)

MARK, ST., THE GOSPEL OF. The genuineness and authenticity of this Gospel are attested by the unanimous voice of ecclesiastical writers. Michaelis has indeed objected to its canonical authority, in common with that of Luke, but on no good ground. [Luke, Gospel of.] According to Papias, Irenæus, and other early writers, Mark committed to writing the gospel which was preached by Peter; and Clement of Alexandria states that he did so at the request of Peter's hearers at Rome. Other early writers add that in this work Mark had the approbation and assistance of Peter; and many passages of the gospel have been thought to bear traces of being written under Peter's direction. From the tradition mentioned above, and from Latinisms and explanations of Jewish phrases and customs contained in Mark's gospel, it appears to have been written at Rome for the benefit of the Latin Christians.

The time when it was written is uncertain. Irenæus says *that it was composed* μετὰ τὴν τούτων (Peter and Paul) ἔξοδον; but whether he means *after the death* of Peter and Paul, or *after their departure* from Rome, is a question much disputed. Upon the whole, the most probable date appears to be about A.D. 64 or 66.

According to the unanimous testimony of the early ecclesiastical authors, the gospel of Mark was written in Greek. The Latin MS. at Venice, said to be part of St. Mark's *autograph*, has long since been proved to be nothing of the kind.

The contents of St. Mark's gospel have been divided into the three following parts:—

Part I. The baptism and temptation of Christ (i. 1-13).

Part II. The public ministry of Christ, up to his last journey to Jerusalem (i. 14—x.).

Part III. Transactions at Jerusalem, the death, resurrection, and ascension of Christ (xi.—xvi.).

The opinion that Mark's gospel is an abridgment of Matthew's has been satisfactorily refuted by Michaelis; for notwithstanding the coincidences between these two gospels, we find, on comparing them, that there are in Mark omissions of and discrepancies with what is contained in Matthew, which it is difficult to account for on the supposition that he wrote with the gospel of Matthew before him. The true mode of explaining these coincidences and discrepancies belongs to the more general question respecting the origin of the first three gospels. [Gospel.] Those who believe that each evangelist composed his narrative from independent sources of information have no difficulty in proving Mark's qualifications for the task; for besides the assistance which he probably received from Peter, what we know of his life proves that he must have had opportunities of constant intercourse with the apostles and first Christians.

(Lardner's *Credibility* and *Lives of the Apostles and Evangelists;* Cave's *Lives of the Apostles and Evangelists;* Kuinoel, *Comment. in Lib. Hist. N. T., Proleg. in Marc.;* the *Introductions* of Michaelis, De Wette, Hug, and Horne.)

MARKET (*mercatum*), a public place and fixed time for the meeting of buyers and sellers. A legal market can exist only by virtue of a charter from the crown or by immemorial user, from which it will be presumed that a royal charter once existed, although it can be no longer produced. A market is usually granted to the owner of the soil in which it is appointed to be held, who, as such grantee, becomes the owner, or lord, of the market. In upland towns, that is, towns which, not being walled, had not attained the dignity of boroughs, markets were frequently granted to lords of manors; but in walled towns or boroughs, particularly in such as were incorporated, the ownership of the soil having usually, by grant from the crown, or other lords of whom the borough was originally holden, been vested in the incorporated burgesses, the course has commonly been to grant markets to the municipal body.

The prerogative of conferring a right to hold a market is however subject to this limitation, that the grant must not be prejudicial to others, more especially to the owners of existing markets. In order that the crown may not be surprised into the making of an improper grant, the first step is, to issue a writ ad quod damnum, under which the sheriff of the county is to summon a jury before him to inquire whether the proposed grant will be to the damage of the king or of any of his subjects. This writ must be executed in a fair and open manner, and the sheriff is bound to receive evidence tendered against, as well as in favour of the grant. But as the writ does not purport to affect the interest of any person in particular, it is not necessary that notice should be given of the time or place at which it is meant to be executed. Notwithstanding a finding by the jury that the proposed market will not be injurious, any party who conceives that his interests are affected by the grant when made, whether he appeared upon the inquiry under the writ ad quod damnum or not, may traverse the finding, or sue out a writ of scire facias, which, after reciting the alleged injury, calls upon the grantee, in the name of the crown, to show cause why the grant should not be cancelled. If a new market be set up without any grant from the crown, the party is liable to be called upon by the crown to show by what warrant he exercises such a franchise [Liberty; Quo Warranto]; and he is also liable to an action on the case for damages, at the suit of any person to whose market, or to whose property, the market so set up by the defendant is a nuisance. A new market is presumed to be injurious to another held within the distance of twenty miles, even though it be on a different day, but this presumption may be rebutted.

Formerly markets were held chiefly on Sundays and holidays, for the convenience of dealers and customers, brought together for the purpose of hearing divine service. But in 1285, by 13 Edward I., c. 5, fairs and markets were forbidden to be held in churchyards; and in 1448, by 27 Henry VI., c. 5, all showing of goods and merchandise, except necessary victuals, in fairs and markets, was to cease on the great festivals of the church, and on all Sundays, except the four Sundays in harvest. The holding of fairs and markets for any purpose on any Sunday was prohibited in 1677, by 29 Charles II., c. 7.

The grantee of a market has a court of record called a court of pie-powder (pieds pouldreux, 'dusty feet'), for the prompt decision of matters arising in the market. [Pie-powder Court.] Such a court being considered necessary for the expedition of justice and for the support of the market, the power of holding it is incident to a grant of a market, even though the royal letters patent by which the grant is made be entirely silent on the subject.

Sales in markets may be of goods actually brought within the precincts of the market, or of goods not so brought. Goods not within the precincts of the market are sold sometimes by sample, sometimes without sample. Where goods are usually brought into the market for sale, it is incumbent on the lord of the market to take care that every thing be sold by correct and legal weights and measures.

For the security of dealings in markets, contracts were formerly required to be made in the presence of an officer appointed for that purpose by the lord of the market, for which service he received from the buyer a small remuneration called market-toll. [Toll.]

It is a rule of the common law that every sale in market-overt (open market) transfers to the buyer a complete property in the thing sold; so that however defective the title of the vendor may be, yet that acquired by the vendee is perfect, even where the property belongs to a person who is under legal disability, as an infant, a married woman, an idiot, or a person in prison or beyond sea. In London every shop is market-overt for goods usually sold there.

This rule is subject to certain exceptions and restrictions. A sale in market-overt does not bind the rights of the crown; nor does it bind the rights of others, unless the sale be in an open place, as a shop, and not a warehouse or other private part of the house, so that those who go along cannot see what is doing, and not in a shop with the shop-door or windows shut, so that the goods cannot be seen. The articles bought must be such as the party usually deals in. The sale must be without fraud on the part of the buyer, and without any knowledge on his part of any want of title in the vendor. If the seller acquire the goods again, the effect of the sale in barring the true owner is defeated. There must be a sale and contract; and therefore the property is not altered in market-overt in goods given, or in goods pawned, or in goods sold to the real owner. The sale must be between sunrise and sunset, and must be commenced and completed in the market.

By 21 Henry VIII., c. 2, 'If any felon rob or take away money, goods, or chattels, and be indicted and found guilty, or otherwise attainted upon evidence given by the owner or party robbed, or by any other by their procurement, the owner or party robbed shall be restored to his money, goods, or chattels.' Since this statute, stolen goods, specified in the indictment, have, upon the conviction of the offender, been restored to the prosecutor, notwithstanding any sale in market-overt.

As stolen horses can be easily conveyed to distant markets, the legislature has frequently interposed to protect the owner against the consequences of a sale in market-overt. By 2 and 3 Philip and Mary, c. 7, 'No sale of a horse stolen binds the property, unless it stand or be ridden an hour together between ten o'clock and sunset, in an open part of the market, and all parties to the bargain come with the horse to the book-keeper and enter the colour, and one mark, at the least, of the horse sold, and pay the toll, if any due, else a penny.' And further, by 31 Elizabeth, c. 12, 'No person shall in any fair or market sell, give, exchange, or put away any horse, mare, &c., unless the toll-taker, book-keeper, bailiff, or other chief officer will take upon him perfect knowledge of the person that shall so sell, give, or exchange any horse, &c., and of his true name, surname, and dwelling-place, and shall enter the same in a book there kept for sale of horses, or else that he so selling or offering to sell, &c. any horse, &c., shall bring unto the toll-taker or other officer aforesaid of the same fair or market, one sufficient and credible person, that can testify before such toll-taker, &c., that he knows the party that so sells, &c., such horse, &c., and his true name, surname, mistery, and dwelling-place, and there enter in the book of the toll-taker or officer, as well the true name, surname, mistery, and place of dwelling of him that so sells, &c., such horse, &c., as of him that so shall testify his knowledge of the same person, and shall also enter the true price that he shall have for the same horse, &c., and that no toll-taker, &c., shall take toll or make entry of any sale, &c., of any horse, &c., unless he knoweth the party that so sells, &c., such horse, &c., and his true name, surname, mistery, and place of dwelling, or the party that shall testify his knowledge of the same person so selling, &c., any such horse, &c., and his true name, &c., and shall make a perfect entry in the book of such his knowledge and of the true price taken or had for any such horse, &c., so sold, &c., so far as he can understand the same; and then give to the buyer a note in writing of the full contents of the same, subscribed with his hand; on pain that every person that shall so sell, &c., any horse, &c., without being known to the toll-taker, &c., or without bringing such witness, or causing the same to be entered as aforesaid, and every person making any untrue testimony, and every toll-taker, &c., offending in the premises, shall forfeit 5*l.*, and that every sale, &c., of any horse, &c., in fair or market not used in all points as aforesaid shall be void.' And by sect. 4, 'If any horse, &c., be stolen, and afterwards sold in open fair or market, and the sale shall be used in all points and circumstances as aforesaid, yet the sale of any such horse, &c., within six months after the felony, shall not take away the property of the owner, so as claim be made within six months, before the mayor or other head officer of the town or parish, if the horse, &c., happen to be found in any town corporate or market-town, or else before any justice of peace of the county near to the place where such horse, &c., shall be found, if it be out of a town corporate or market-town, and so as proof be made within forty days, by two sufficient witnesses, before such head officer or justice, that the property of the horse, &c., so claimed, was in the party by whom such claim is made, and was stolen within six months next before such claim, but that the party from whom the horse, &c., was stolen may at all times after, notwithstanding any sale in fair or market, have property and power to take again the said horse, &c., upon payment or offer to pay the party that shall have the possession and interest of the same horse, &c., if he will accept it, so much money as the party shall depose and swear before such head officer or justice of peace, that he paid for the same *bonâ fide* without fraud or collusion.' This statute extends to a horse taken by wrong, though it be not stolen.

By 1 James I., c. 21, 'No sale, exchange, pawn, or mortgage, of any jewels, plate, apparel, household stuff, or other goods, wrongfully purloined, taken, robbed, or stolen, and sold, uttered, delivered, exchanged, pawned, or done away, within London and its liberties, or Westminster, or Southwark, or within two miles of London, to any broker or pawn-taker, shall work or make any change or alteration of the property or interest.'

A market is generally appointed to be held once, twice, or three times in a week, for the current supply of commodities, mostly of provisions. A large market held once or twice a year is called a fair; and, according to Lord Coke, a large fair held once a year is a mart.

Fairs have all the legal incidents of markets, and are subjected to further regulations by 2 Edw. III., c. 15, one of which requires, that at the opening of the fair, proclamation be made of the time it is to continue.

MARKETS, AGRICULTURAL. The more numerous markets are in any well cultivated country, provided they are at a sufficient distance not to interfere with each other, and on different days of the week, the greater saving there is of time and labour of conveyance. Good roads or navigable rivers are of great importance to a market-town; and if there are mills in the neighbourhood, where corn can be ground, they will increase the advantage to the farmer causing a regular demand above what the immediate sumption of the place may require.

The vicinity of a good market where every kind of agricultural produce will always find purchasers at a fair price, greatly adds to the value of a farm, especially if good roads lead to it; and the advantage is the greater if it be a populous town, which not only consumes much produce, but from which various kinds of manure may be brought by the teams which have carried the produce to market. It is this which so much enhances the rent of land near London and all great cities, and makes the agriculture there approach nearer to horticulture, which entirely depends on extraneous manure.

Few things are so bulky as corn; a sack weighing 240 lbs. when brought to market may be worth a guinea or thirty shillings, but if it is carred 50 miles to a market, the net value will be much reduced; and if at that market there is no demand beyond what is required for the immediate neighbourhood, and no means of exportation, a very small surplus will glut it, and reduce the price still lower. The nature and situation of the markets are consequently a most important consideration in any agricultural enterprise. Where markets are very distant, the only profitable produce is live-stock, which can be driven a long way at a small expense. All countries, however fruitful the soil, which are thinly peopled, and have no ready markets for corn, must necessarily remain in pasture or be uncultivated. An increase in the population and the establishment of manufactures give rise to an increased number of markets, and bring more land into a state of profitable cultivation as arable land. If a regular supply of food is essential in a manufacturing population, so the demand for it causes more to be produced. A regular supply to the markets keeps prices regular, fluctuating only according to the abundance or scantiness of the crops.

It is for the general advantage that the farmers should bring their corn in regularly, without speculating on a rise or fall of prices. As a general principle, a farmer should thrash his corn at a time when the work out of doors is less important, or when the weather is unfavourable for it. He must do so whenever the fodder for his cattle diminishes, and a fresh supply of straw is required: and as soon as the grain is in sufficient quantity to require a team to take it to market, it should be sold. But many circumstances may make this regular course inconvenient. There may not always be a demand for the article, and if a sale is forced, a diminution in the price must be submitted to. In some situations purchasers cannot always be found, at any price, and a granary to store corn in becomes indispensable. In commercial countries there are always speculators in corn, who make their profit by buying and selling the commodity. The farmer is tempted to withhold his corn when the price is low, in order to have a greater profit when it rises; and, to a certain degree, he is justified in doing so: but if he speculates on his own corn, when he can obtain a fair price for it, he becomes a merchant, as much as if he purchased to sell at a profit. When there is a good market at hand, the produce of the farm should be regularly sold, so as to give the farmer a constant supply of money for his operations, besides a portion set apart for the rent and other regular payments. In this way he will, at the end of the year, have had the average price, without risk and without speculation; and by a little caution he may obtain somewhat more than a mere average, provided he has always more money at hand than his immediate wants require, and is never forced to sell.

In order that the farmer may not be imposed upon, he must either make himself acquainted with the transactions in different neighbouring markets, or he must rely on the honesty and judgment of an agent, whose business it is to attend markets and buy and sell for others. These men are generally called salesmen or factors, and when their character for honesty is established, the small sum which is paid them on the sales will generally be found to be fully compensated by the advantage which their knowledge of the markets and of the quality of the articles gives them. This is particularly the case in the buying and selling of live-stock, which requires much more knowledge and experience than most other articles. The people whom the farmer has to deal with in fairs and markets have generally a thorough knowledge of the real value of the articles offered for sale, by constantly frequenting markets, and confining their attention to buying and selling only. The farmer is therefore seldom a match for the dealer, and will find it his interest to employ a person equally skilled in these matters. The farmer would lose too much valuable time, and be led to unnecessary expense, if he attempted to obtain the requisite knowledge, by frequenting different and distant markets, as the dealers do

Notwithstanding this, a certain knowledge of markets and prices is necessary to enable a farmer to detect imposition or ignorance in the person he employs, and the occasional attendance at fairs and markets is indispensable to obtain this knowledge.

When the whole bulk of the articles to be sold is brought into the market and exposed for sale, the market is called a *pitched* market; when only a small portion is brought, to show the quality of the whole, it is called a *sample* market. Each has its peculiar advantages and inconveniences. In a pitched market the buyer sees what he purchases, and can thoroughly examine it; he may therefore be induced to offer a more liberal price; but it often happens that he has to carry a load away by the same road by which it was brought; the sacks also have to be returned, which causes frequent mistakes and losses; and there is an evident waste of time and labour. When the article is sold by sample there is more reliance on the honesty of the seller, and the buyer naturally keeps on the safe side, by offering somewhat less, as a kind of insurance against slight deceptions. The buyer keeps half the sample and the seller the other, that they may be compared with the bulk in case of any dispute. The seller sends the article sold on a day agreed upon; and if it is corn the sacks are brought back when the waggon or cart returns home. The price is usually paid on the next market-day. In very large dealings the selling by sample is generally adopted; small quantities are usually pitched.

Great inconvenience arose formerly from the various measures used in different markets; and dealers required tables to reduce them to one standard. The law which has established one uniform standard of weights and measures has removed all difficulty, and the rapid and frequent communications which now take place between the great towns and every inhabited spot in the kingdom have made prices much more nearly alike, for all articles of general necessity in all parts of Great Britain, than in any other country; and the prices in the markets of the great towns differ so little, that in the country these are generally regulated by those of London, Liverpool, or Edinburgh. Every farmer who cultivates land to any extent must attend to the fluctuations of the markets, and his operations may be much influenced by the comparative prices of different kinds of grain.

MARKLAND, JEREMIAH, was born the 29th of October, 1693, at Childwall, in Lancashire, of which his father was vicar. He was educated at Christ's Hospital, London, whence he was sent to St. Peter's College, Cambridge, in 1710. He took his degree of M.A. in 1717, and was soon afterwards elected a fellow and tutor of his college. After residing at Cambridge for some time, he removed to Punsborn, in Hertfordshire, to undertake the education of Mr. Shode's son, and afterwards travelled with his pupil on the Continent. During the latter part of his life he resided at a small village near Dorking, in Surrey, where he died on the 7th of July, 1776.

Markland lived in the greatest retirement, and devoted a long life to the diligent study of the Greek and Roman writers. He was one of the best English scholars and critics of the last century, but wrote very little. He edited the 'Sylvæ' of Statius (Lond., 1728), the 'Supplices' (1763), and the two Iphigenias of Euripides (1771), which have been republished by Gaisford. Subjoined to his edition of the 'Supplices' are his 'Explicationes veterum aliquot Auctorum.' He also contributed some observations to Taylor's edition of Lysias, to Bowyer's reprint of Küster on the Middle Verb in Greek, and to Musgrave's edition of the 'Hippolytus.' In 1745 he published 'Remarks on the Epistles of Cicero to Brutus, and of Brutus to Cicero, in a Letter to a Friend:' in which he attempts to prove that they could not have been written by Brutus or Cicero; and in an Appendix to this work he also maintains that the four orations which occupy a place in Cicero's works, under the titles of 'Pro Domo sua apud Pontifices,' 'De Haruspicum Responsis,' 'Post Reditum in Senatu,' and 'Ad Quirites post Reditum,' are also spurious. This opinion has been supported by F. A. Wolff and many other able critics.

MARL. A mixture of calcareous and argillaceous earth is commonly called marl; in Norfolk soft chalk used on the lands is called marl; in Worcestershire and Somersetshire red clays are termed marls. In geology we have the red marl, the black marl at the base of the lias, the chalk marl, the freshwater marls of Headon Hill in the Isle of Wight. The term is too vague for scientific descriptions.

MARL, an earthy substance found at various depths under the soil, and extensively used for the improvement of land. It consists of calcareous and argillaceous earth, in various proportions, and as the former or the latter prevails, so it is beneficially employed on clays or sands. There are several distinct sorts of marl—clay marl, shell marl, slate marl, and stone marl. The clay marl has probably been formed by the slow deposition of clay suspended in water and mixed with the particles of decomposed shells. When these shells have retained their form, or appear in fragments in the marl, it is called *shell marl*. A considerable compression and a complete decomposition of the shells form slate marl and stone marl. The effect of marl is the same as that of clay and chalk upon sandy soils; on heavy soils its effect is proportioned to the quantity of calcareous earth which it contains. The peculiar advantage of marl is its readily crumbling to powder by the effect of air and moisture. If it is too compact to dissolve under these influences, it can only be made useful by burning, and in this case it is only a substitute for lime, its value depending on the proportion of calcareous earth in the marl. To ascertain this proportion, the marl is thoroughly dried over the fire and pulverised; a certain quantity is weighed and put into a cup; diluted nitric acid or strong vinegar is poured slowly upon it, out of a vessel containing a known quantity, until all effervescence ceases. A quantity of the acid equal to that which has been used is placed in a cup, and fine marble dust is gradually put into this, from a certain quantity which has been weighed, as long as any effervescence appears. The weight of the marble dust used for this purpose evidently gives the quantity of calcareous earth in the marl, since it takes the same quantity of acid to dissolve it.

Marl is often found very near the surface, so as to mix with the soil in ploughing; but unless there be a sufficient depth of soil above, its presence does not indicate great fertility. It is generally best when found at a moderate depth, so as to be readily dug out and carted on the adjacent lands. In Norfolk, where a marl containing a large proportion of clay is found in many places under a light soil, it is frequently spread over the surface at the rate of two or three hundred cart-loads per acre. This dressing, joined to underdraining, makes a wonderful improvement on soils which before were scarcely worth cultivating, owing to their being loose and wet in winter. The clay marl makes them retain sufficient moisture, while the superfluous water is carried off by the drains.

Marl being often found with blue veins through it, a marbled earth containing sulphate of iron, or vitriol, has sometimes been mistaken for it; but this, far from being useful, is quite the reverse; for sulphate of iron in any quantities will produce absolute sterility in a soil. The nature of marl can always be detected by pouring a little vinegar on it; if it does not effervesce, it is only clay, and probably contains iron, which is readily discovered by the red colour on burning a portion in the fire, or by mixing it with water and then adding an infusion of gall-nuts in the strained liquor: the black colour immediately detects the sulphate of iron.

Marl when put fresh upon the land requires some time in order to become effective. It should therefore be laid on the surface and spread before winter, leaving it there for a considerable time before it is ploughed in. It is most advantageous to put it on the land when it is in grass, and to roll and harrow it repeatedly, in order to expose it to the effect of the air and rains. Alternate frosts and thaws greatly assist its pulverization.

Too much marl may be put upon land, and it is better to repeat the marling after a few years than to put on a great quantity at once. The proper dose depends on the nature of the soil and that of the marl. Sand will take a very large quantity of clay marl: but even shell marl should be put cautiously on clay soils; they may not always be improved by a great addition of calcareous matter. There is no greater mistake than to imagine that marl is a substitute for dung. Light land which has been marled becomes less hungry, and marl will make dung go further, but it will not act well on a poor soil without dung; and if the land is severely cropped after marling, and not sufficiently recruited with enriching manures, it will be sooner exhausted than if it had not been marled; for marl, like lime, renders soluble the natural humus in the soil.

It is very easy to judge of the value of any marl on a given soil when the proportion of calcareous earth and clay in its composition has been ascertained. We have only to consider what improvement will be produced in the texture by the addition of so much lime and so much clay. The advantage of marl over pure chalk is only that it is more readily pulverised; but wherever chalk can be had at an equal expense, it is far more effectual and of longer duration on clay soil than the best marl. On sands it may be different, and the fat marls containing much unctuous clay are preferable from their binding nature.

An excellent use of marl is in forming composts with dung and peat earth. It is laid in layers with the dung and peat, and if the heap is well soaked with urine or the washings of stable-yards, it will in a short time become a most valuable manure for all kinds of soils. Many peat bogs are formed on a marly bottom; where this is the case, and it can be drained, or the water got rid of in any way, the marl, when laid on the surface, consolidates the peat by its pressure, and soon makes it capable of producing good herbage by converting it into a rich vegetable mould.

The expense of marling land can only be calculated when the distance of the marl and the depth from which it is raised are known; when it lies in a stratum under the land, it is generally the cheapest plan to open a pit in each field; for the carriage of the marl is the chief expense. Within a distance of two hundred yards from the pit, it is found by experience that the cheapest way of putting it on the land is by means of men wheeling it in barrows with the help of planks, as is done in digging canals and other similar public works.

MARLBOROUGH. [Wiltshire.]

MARLBOROUGH, JOHN CHURCHILL, DUKE OF, the ablest general and most consummate statesman of his times, was born at Ashe in Devonshire, on the 24th of June, 1650. He was the second son of Sir Winston Churchill, a gentleman of antient family, whose fortunes had suffered severely in the civil war, through his devotion to the royal cause; and whose loyalty, after the Restoration, was rewarded with sundry small offices under the crown for himself, and with the more questionable benefit of appointments for his children in the profligate court of Charles II. Arabella Churchill, his daughter, became first maid of honour to the Duchess of York, and next mistress to her husband the Duke, afterwards James II.; and John Churchill, who was appointed page to the same prince, doubtless owed his early advancement to this disgraceful connection. It is remarkable that one of its fruits, James FitzJames, duke of Berwick, proved a commander of renown only less illustrious than his maternal uncle.

The natural talents and merits of Churchill however were of too high an order to be solely dependent on the patronage which had sullied the honour of his house. Notwithstanding the disadvantages of a neglected education, which seems to have been confined to a short residence at St. Paul's school, he gave early indications of spirit and intelligence; and his desire for a military life having been gratified by his patron with a commission, he invariably distinguished himself in each of his early campaigns: in the defence of Tangiers against the Moors; and in the successive operations in which the English troops shared as auxiliaries to the French armies under Louis XIV. during the unprincipled alliance of Charles II. with that monarch against the Dutch. On the great theatre of continental warfare, in which Churchill continued to serve from 1672 to 1677, his brilliant courage and ability, no less than the singular graces of his person, attracted the notice of the illustrious Turenne, who pronounced, with prophetic sagacity, that 'his handsome Englishman' would one day prove himself a master of the art of war.

On the conclusion of the peace of Nimeguen, Churchill, now a colonel, returned to England, and was happily rescued from too licentious a career of dissipation by an ardent attachment for the celebrated woman who became his wife, and who, for good and evil, influenced the whole tenor of his subsequent life. This was Sarah Jennings, a young lady of birth, genius, and beauty, whose irreproachable purity in a vicious age might have rendered her wort of the uxorious love of the hero, if her imperious tem had not disgraced his submission to its tyranny, alienated his political friends, and embittered his domestic peace. She had been placed, like himself, at an early age, in the household of the Duke and Duchess of York, where she had become the favourite associate of their daughter the Princess Anne, and had acquired over the spirit of the future queen that commanding influence which it belongs to the stronger to exercise over the weaker mind. Her marriage separated neither her husband nor herself from their service in the ducal household; Churchill was confidentially employed by the Duke of York on many political occasions; and when the Princess Anne was married, his wife was, by her express desire, made a lady of her bedchamber. Churchill had previously been raised, through the interest of James, to a Scotch barony; and when that prince succeeded his brother on the throne, he was further promoted to an English peerage by the style of Baron Churchill of Sandridge. Under this title he contributed by very effectual military service to the suppression of Monmouth's rebellion, and was rewarded with his master's unbounded reliance on his fidelity.

This confidence he basely betrayed, before and after the landing of William of Orange, with a deliberate treachery, which all the sophistry of political and religious party has vainly laboured to justify, and the infamy of which no excuse, even in the difficult circumstances of the times, can be found to palliate. After offering his services to the Prince of Orange, he accepted the command of a large body of James's troops to oppose him; after accepting that command, he deserted to the prince; and when William became king, he received at his hands the title of earl of Marlborough, and the offices of privy-counsellor and lord of the bedchamber, as the reward of his ingratitude. His subsequent conduct throughout the reign of William was consonant to this outset: for he corresponded and intrigued with the exiled king. By this double treason and perjury, he for ever took from the former desertion of his deluded sovereign all extenuation of a conscientious principle; he broke his allegiance to the new king whose favours he had accepted; and he branded his own inconsistency with the meanest motives of self-interest and self-preservation.

William III., who knew equally well how to estimate the capacity and the sincerity of Marlborough, alternately imprisoned and employed, cashiered and re-commissioned, the man whom he is said on his death-bed to have recommended to his successor as the fittest person to 'lead her armies and direct her councils.' The favour of Marlborough's wife with Queen Anne was probably a more powerful, though less rational, motive for the appointment which he now received to the command of the allied forces in the war of the Spanish succession; and he immediately entered on a course of glorious achievement which since the days of Henry V. had never been equalled, and which until our own eventful times was never surpassed by any British commander or army.

When Marlborough landed at the Hague, in June, 1702, to take the command of the allied army, the French under the skilful Boufflers, by the superior force and vigour of their preparations, had already been able everywhere to assume the offensive; the very frontiers of the Seven Provinces were threatened; and it was feared that the efforts of the English general must be restricted to the defence of the republican territory. Moreover, he had to encounter the petty jealousies and disobedience of the other allied commanders, and the opposition of the Dutch deputies, whom the states-general sent into the field to control the movements of their troops, and whose ignorance of war and dread of responsibility were grievous impediments to every bold enterprise. Yet, notwithstanding these obstacles, which shackled all his operations and heavily taxed his forbearance, he succeeded, by a series of masterly movements, in compelling the French armies to retreat in all quarters, delivered the Dutch frontiers from their presence, and closed the campaign by the sieges and capture of Venloo, Ruremond, Stevenswaert, and Liège. These services, short as they fell of the results which might have been attained if the genius of the commander had been allowed its full play, were so far beyond the anticipation of the allies, that the states-general loaded him with eulogy, and Queen Anne elevated him to the ducal title.

The following campaign of 1703 presented a repetition of the same obstacles to the enterprising spirit of Marlborough. Arrested by the timidity of the field-deputies, and harassed by the misconduct of the Dutch generals, he was allowed to effect nothing in the Netherlands except the reduction of Bonn, Huy, Limburg, and Guelders; while the elector of Bavaria with his own troops, and the French under Villars, broke into the Imperial dominions on the Danube, signally defeated the forces of the emperor, alarmed that prince for the safety of his capital, and threatened dissolution to the grand alliance itself. These dangers roused Marlborough to attempt the masterstroke of his military career. Early in the campaign of 1704, after providing for the safety of the Netherlands, he secretly conceived and executed upon his own responsibility the bold design of marching into Germany at the head of the English troops. He formed a junction on the Danube with the Imperialists; stormed the strong Gallo-Bavarian lines at Donauwerth; and finally, in concert with the Imperial commander Prince Eugene of Savoy, a kindred spirit, attacked the enemy on the 13th of August, 1704, at and near the village of Blenheim on the Danube, with such skill and impetuosity as to inflict on them a total defeat. In this memorable battle, the French and Bavarians, who were commanded by the elector in person and Marshals Tallard and Marsin, lost above 30,000 men in killed, wounded, and prisoners, Marshal Tallard himself being among the latter. But the moral and political effects of the victory were yet greater: it dimmed the lustre which the successes of Louis XIV. had shed upon the French arms, and destroyed the charm of their invincibility; it delivered the empire; and it laid Bavaria prostrate before the allies. For this great exploit Marlborough was rewarded with the conveyance to himself and his heirs of the crown lands at Woodstock, on which it was also resolved to erect for him a palace at the royal cost. This noble design to perpetuate the memory of his services was ultimately realised, under the direction of the architect Vanbrugh, in the majestic though cumbrous pile which still bears the title of the castle of Blenheim; but the public enthusiasm which had dictated so splendid a monument was stifled in faction, and the completion of the work is indebted more to the care of his high-spirited widow, than to the good faith of the crown or the munificence of the nation. The gratitude of the Imperial house for the preservation of its capital and dominions was neither less loud nor more durable. The territory of Mindelheim, with the title of prince of the Holy Roman empire, was conferred upon the victor of Blenheim; but though the premature death of his only son left him without heirs male, the dignity was not allowed to descend in the female line; and when the lands of Mindelheim were included in the districts restored to Bavaria at the peace, the Imperial court had the meanness to withhold any compensation from its deliverer.

The march into Germany had liberated Marlborough from the paralyzing control of the Dutch field-deputies and the wretched intrigues of their officers. But his return to the Netherlands subjected him again to the same impediments and annoyances; and in the campaign of 1705, though he skilfully forced the French lines between Namur and Antwerp, he was once more restrained from striking any decisive blow upon the enemy. But in the following year (1706), happily for his wishes, the great efforts of the French in the Low Countries under Villeroy enabled him to tempt them to an encounter; and in the great battle of Ramilies he gained a second victory, so complete that the enemy, with a loss of 13,000 men, eighty standards, and all their cannon, were compelled to evacuate the whole of Spanish Flanders. Brussels, Ghent, Antwerp, and Oudenarde opened their gates to the conqueror, and the strong fortresses of Ostend, Menin, Dendermonde, and Ath were reduced by regular sieges.

Through the apathy of the Dutch these successes were followed, in 1707, by a year of inaction; but in the summer of 1708 an attempt of the enemy to recover possession of Spanish Flanders brought on a general engagement at Oudenarde, which terminated in the utter rout of the French under the dukes of Burgundy and Vendôme, with a loss of 14,000 men. The forcing of the passage of the Schelde and reduction of the great fortress of Lisle, a place of first-rate strength, and defended by a garrison of 15,000 men under Boufflers, were the chief fruits of this victory. The following year (1709) was distinguished by the sanguinary combat of Malplaquet, the most dubious of Marlborough's exploits; since, though he was undoubtedly victorious, the assault of an immense army under Villars in a position of tremendous strength, has exposed him and his colleague Eugene to the charge of reckless temerity; and the result produced no advantages equivalent to the frightful carnage by which it was purchased. The next campaign (of 1710) opened with another successful passage of the enemy's lines by Marlborough, which was followed by the reduction of Douay, Bethune, and other posts. Villars employed the autumn and winter in constructing a series of strong lines on the Flemish frontiers, to cover the interior of France against the further advance of the victorious allies; and so confident was he in the impregnable character of these works, that he openly boasted of having 'at last brought Marlborough to his *ne plus ultra*.' The futility of this vaunt was disgracefully exposed, and never did the military genius of Marlborough break forth with more splendour than in this, which was destined to be his final campaign; even while his mind was distracted, and his energies were crippled by the malignant intrigues of his political enemies in England. On the 5th of August, 1711, by a sudden and unexpected manœuvre, he burst through the lines of his able though gasconading antagonist near Bouchain, formed the siege of that strong fortress, and effected its capture—his last achievement—under the eyes of the superior French army.

The political intrigues which disgraced the court of Queen Anne, and closed the triumphs of Marlborough, belong rather to general history than to the biography of the illustrious leader who was their victim. But they were fomented in his domestic circle; and his imperious wife, if she had assisted his rise, was also the real instrument of his fall. So romantic was the friendship which the queen had cherished for her, that utterly impatient of the etiquette and restraints of a court, and under the assumed name of Mrs. Morley, laying aside every distinction of her rank, she corresponded, in all the freedom and affectionate intimacy of an equal, with the duchess as 'her dear Mrs. Freeman.' If the duchess had been contented to use her influence with moderation, the easy nature of the queen might never have felt the yoke. But Anne was sincerely attached to Tory principles, the duchess was a violent politician, and notwithstanding her husband's Tory connections and prepossessions, she had become as warmly devoted to the Whig as the queen to the opposite party. As long as William III. lived, an aversion which they shared to that prince and his government, united the two ladies in a band of political sympathy more powerful than their own differences of opinion. But when his death relieved them from an object of common dislike and apprehension, Anne gave way to her Tory predilections; the duchess ardently advocated the rival cause; and so arrogantly and intemperately were her tyrannical injunctions enforced, that they ceased not until the weak queen had been compelled to surround herself with the leaders of a party whom she detested. Thus goaded and outraged, Anne was gradually alienated from her former friend, whom at last she learned to hate as cordially as she had once loved her; the intriguer Harley, the most perfidious of political adventurers, found it easy to increase the feud; and the machinations of the bedchamber-woman, whom he made his instrument, were sufficient to change the political aspect of Europe.

The hatred of the queen for the duchess was soon unjustly and ungratefully extended to the man who had achieved the principal glories of her reign, and whose great merits were innocent of personal offence. The abject entreaties to which Marlborough descended, in vainly imploring the queen to spare his duchess the mortification of a dismissal from her place in the royal household, present the most humiliating scene of his life. The next blow struck by his enemies was his own removal from command; and this measure was envenomed by their malignity with a charge of peculation, which really appears to have been unfounded. Before the storm thus raised against him Marlborough withdrew to the Continent, where he remained until just previous to the death of Queen Anne. George I., immediately on his accession, restored him to his military offices of captain-general and master of the ordnance; and in the undisturbed enjoyment of these dignities he passed the eight remaining years of his life. In this interval, two paralytic strokes shook his strength, but without at all seriously impairing his faculties; and the line which Johnson inserted in the 'Vanity of Human Wishes,'—

> 'From Marlborough's eyes the streams of dotage flow,'

was at least a poetical exaggeration. For he continued to attend his parliamentary and official duties until a few months before his death, which occurred when he was in the full possession of his senses, and in the seventy-second year of his age, on the 16th of June, 1722. On the death of his son, which happened during the duke's lifetime, the reversion to the ducal title and estate of Blenheim had been settled on his daughters and their heirs male; and the eldest, who thus succeeded her father, having died leaving no son, the family honours descended through her next sister, the lady of Charles Spencer, earl of Sunderland, to the house which still inherits them, and which, in our own age, has assumed the name of Churchill.

In estimating the character of Marlborough under its twofold aspect of political and military greatness, it will readily be concluded that he was the most distinguished personage of his country and times. As a statesman, he was unrivalled in personal address and diplomatic skill, in the arts of persuasion, and in the powers of combination and arrangement. He was the life and soul of the grand alliance which arrested the ambitious career of Louis XIV. and preserved the liberties of Europe; his influence pervaded every continental court; and by his energetic hand was set in motion every spring of that vast confederacy, which centred its only real point of confidence in his spirit. One of his bitterest enemies and ablest contemporaries, Bolingbroke, was not ashamed to acknowledge, after the grave had closed over him, that he was the greatest minister that this country had ever possessed.

As a general, it has not been the fate of Marlborough to be numbered with the few, such as Maurice of Nassau, Gustavus Adolphus, or Frederic of Prussia, whose genius has stamped its impress upon the warfare of their times, and made a distinct epoch in military science. He left the art, which he practised with unrivalled ability, in the same state in which he had found it; nor is there a single change or improvement in strategy attributed to his master-mind. But if this absence of inventive power may seem to detract from his claim to the very highest order of military merit, it must not the less be remembered that he was beyond comparison the most accomplished commander of his warlike age. It was an age of formal tactics and deliberate sieges; which had produced Vauban and Coehorn, raised the art of fortifying for the time to an apparent perfection, and exaggerated the importance of regular fortresses and long-drawn lines of intrenchment. In the system of operations which naturally grew out of such circumstances, Marlborough greatly excelled; and of six conspicuous occasions on which he is recorded to have penetrated the intrenched positions of his opponents, five were nearly bloodless triumphs of his tactical skill. In all these, his success equally proclaims his own superiority over his antagonists, and the vicious practice of the age, which, in attempting to cover an assailable country with extended chains of intrenchment, laboriously invited as many points of attack as it multiplied works. But Marlborough himself, in his own practice, adhered to the same rules of defence, of which his success might have shown him the futility. Once indeed, after the victory of Oudenarde, he broke through the pedantry of rules, and proposed to Eugene, by masking Lisle and Tournay with a corps of observation, to penetrate into the heart of France: a plan which, instead of consuming the remainder of a victorious campaign in the siege of two fortresses, might have triumphantly ended the war. But the bold proposal seemed too hazardous even to Eugene.

Each however of Marlborough's great battles, and of the operations which preceded them, will testify that his skill comprehended much more than the conduct of a war of sieges and intrenchments. The consummate adroitness with which the objects of his memorable march into Germany in 1704 were concealed from the enemy, and their fears successively misdirected to the Moselle, to Alsace, and to Landau, until it was too late to prevent his real designs on the Danube, must ever be numbered among the most perfect efforts of military science. So also may be cited, with equal admiration, the singular and beautiful manœuvres by which the battle of Ramilies was won, and of which the curious military reader may find an ample and lucid account in the memoirs of General Kane, himself an eye-witness and an excellent tactician. And when it is considered that the successes of Marlborough were gained with an army in which the native British contingent never amounted to 20,000 men, and of which three-fourths were composed of a motley roll of Dutchmen, Hanoverians, and

Hessians, Danes, Wirtembergers, and Prussians, and moreover that his plans were in almost every enterprise marred by the timidity or obstinacy of the Dutch deputies, the moral triumphs of victory with such heterogeneous materials, and under such heavy disadvantages and discouragements, must very much raise our estimate of the genius by which they were won.

As a man, it is less easy to form a true judgment of the character of Marlborough than as a statesman or a general. If we were to estimate his moral worth by his double treachery to James II. and to William III., by his tame submission to the ingratitude of Queen Anne, and by the avarice which degraded his private habits, he might justly be numbered among the greatest and meanest of mankind. Nor is there any weight in the extenuation which has been attempted for his political falsehood, that he was no worse than his contemporaries; since it is the test of true greatness to rise above, not to sink to, the level of a common corruption. Yet with all his faults, it would be easy to prove that there were not wanting in Marlborough many of the qualities of a good patriot and a good man. His friend the lord treasurer Godolphin and himself appear, of all their contemporaries, to have been most free from the virulent spirit of faction and most sincerely devoted to the true honour and interests of their country. The attachment of Marlborough to the tenets and principles of the Church of England was sincere and pure; he was unaffectedly a person of strong religious feeling and practice; and in these respects the example which, as a commander, he held out to his troops, and enforced in his camp, of a piety without fanaticism, was as salutary as it has been infrequent. His courage too, which the inconceivable baseness of faction affected to doubt, and which in his youth had been fiery and impetuous, displayed in his later years the calm and collected spirit of the Christian hero. In public action he was ever as humane and merciful, as towards personal enemies he was placable and magnanimous. In private life, if we except the stain of parsimony, his conduct, at least after his marriage, was a pattern of moral virtue; his temper was imperturbably sweet, gentle, and affectionate; and he was but too fond a husband, too confiding a friend, and too indulgent a master.

The principal biographies of Marlborough and memoirs relating to his campaigns are:—1, Lediard's Life of him (3 vols. 8vo., London, 1736). 2, An anonymous Life, published in 8vo. in 1713, and accompanied by a Life of Prince Eugene, evidently written by one who had served under the duke and shared his confidence. 3, Dumont and Rousset, 'The Military History of Prince Eugene of Savoy, the Duke of Marlborough,' &c. (translated from the French by P. Chamberlen, folio, London, 1736). 4, 'Histoire de Jean Churchill, duc de Marlborough' (3 vols. 8vo., Paris, 1808): a signal foreign tribute to his greatness, since it was composed by order of Bonaparte, and written, with a few exceptions, in a fair and candid spirit. 5, Coxe's 'Memoirs of John, duke of Marlborough' (3 vols. 4to., London, 1818-19):—a work of which the chief value consists in a great mass of original correspondence, published from the family papers at Blenheim and other sources. 6, Brodrick's 'Complete History of the late War in the Netherlands' (8vo., London, 1713). 7, Kane's 'Campaigns of King William and Queen Anne, from 1689 to 1712,' &c. (8vo., London, 1745). 8, Millner's 'Journal of all the Marches, Battles, Sieges, &c. of the Confederate High Allies, from 1701 to 1712, under the conduct and command of the Duke of Marlborough' (8vo., London, 1733).

MARLOW, GREAT, a market-town, parliamentary borough, and parish, in the county of Bucks and hundred of Desborough. The situation of the town, on the left bank of the Thames, is pleasant and picturesque. Its direct distance from Buckingham is 30 miles south by east, and from London about 29 miles west by north. There are two principal streets, in the form of a T, and three smaller ones. The parish church, dedicated to All Saints, is a handsome modern structure, which was consecrated in 1835, and is surmounted by a spire. A suspension bridge was erected over the Thames in 1835; its span from pier to pier is 75 yards. The living, a vicarage in the diocese of Lincoln and patronage of the dean and chapter of Gloucester, produces a net income of 172*l*. In the year 1628 Sir William Borlase founded a school here for the education of poor boys. The number of scholars in 1833 was twenty-four, and the subjects then taught were reading, writing, and arithmetic. The income of the charity at the latter date was 118*l*. 12*s*. 10*d*., out of which the schoolmaster received a salary of 50*l*. A portion of the remaining income has been appropriated since 1822 to the payment of a schoolmistress, who teaches twelve poor girls to read, make lace, and do plain work. Besides the above there is a national school, supported by voluntary donations, for educating children of both sexes; there are also the Oxford Lane almshouses, and several other benevolent foundations of minor importance. (See the *Further Report of the Commissioners on Charities*, pp. 133-145.) The borough has returned two members to parliament since the reign of Edward I. Its population in 1831 was 4237.

(Langley's *History of the Hundred of Desborough and Deanery of Wycombe*, Lond., 1797, 4to.; *Parliamentary Papers*, &c.)

MARLOWE, CHRISTOPHER, a dramatic writer of some eminence, was born, according to Malone, in 1565, but the exact date is unknown. All that is known of his life may be given in a very few lines. He was entered of Corpus Christi College, Cambridge, took his bachelor of arts' degree in 1583, and that of master of arts in 1587. On leaving the university he became a playwright, and perhaps an actor. His moral character appears to have been bad. He was killed in a quarrel of a disgraceful nature, June 1st, 1593, as appears from the register of the *old church* at Deptford, from Anthony à Wood, and others.

The following plays are attributed to him:—'Dr. Faustus,' 'Edward the Second,' 'The Jew of Malta,' 'Tamburlaine the Great,' 'Lust's Dominion,' 'The Massacre at Paris,' and 'Dido, Queen of Carthage.' The prevailing opinion however is that the three first only are his sole productions.

Both the matter and the style of 'Tamburlaine' are asserted to differ materially from Marlowe's other compositions, and there is reason to believe that 'Lust's Dominion' is later than his time.

There remain, then, 'The Massacre of Paris,' 'The Jew of Malta,' 'Edward the Second,' and 'Faustus.' Of the first little need be said; for the text, as it now stands, is an imperfect copy of a hasty work, as Collier has very well shown by a comparison of the received version with one leaf of a contemporary MS.

'The Jew of Malta' is one of those extraordinary impersonations which imply in the chief character a villainy more than human; such, in fact, as was ascribed only to the nation to whom Barabas belongs. There is a general resemblance between Barabas, the 'Jew's dochter,' in the old ballad, and Shylock; but they are like, not as imitations of each other, but as representations of one class, supposed to contain in itself malignity and avarice, and cruelty beyond all comparison.

'Faustus,' which succeeded 'The Jew of Malta,' is a play to which greater interest is attached at present than fifty years ago, owing to the celebrity of Goethe's 'Faust.'

Those who consider that the 'Faust' of Germany is the greatest conception of human invention—who believe that a deep meaning lies hid behind all the apparent absurdities, and that the moral influence of the work is of a high and impressive kind—will of course laugh at any attempt at comparing the German with his English predecessor. At the same time they must allow that Marlowe's play is one of the first, if not the very first attempt at portraying the struggles of a man whose faith is wavering, the first exhibition in a dramatic shape of that doubting spirit which has been on the ascendant for the last four centuries. Moreover the solitary horror of Faust's death far surpasses the stage-effects which tell so strongly in the last scene of the first part of the German poem; and it would not be hard to show that Goethe has borrowed not a little from his English rival.

Perhaps, on the whole, we must assign the first place among Marlowe's works to 'Edward the Second.' It is the prelude to the Shaksperian 'History,' and contains many passages which almost come up to Shakspere's manner. Those who wish to pursue the subject at greater length may consult an interesting article in the 'Quarterly Review,' which adds much to our information on the subject of the English drama.

Owing to the carelessness of the printers, many lines have been confused in Marlowe's plays, to the grievous injury of various passages, which now appear to be prose, though they are in reality verse.

Marlowe has been compared to Æschylus: there is something specious in the comparison, but it can only be very general. To him we are indebted for the first regular form of the English drama cleared of rhymes; and he may be considered as the link between Shakspere and the Moralities. 'Faustus' is nearly a 'morality;' 'Edward the Second' is a regularly formed 'history.'

Besides his plays Marlowe translated Ovid's 'Art of Love' and some other classical works.

(Collier's *History of Dramatic Poetry;* Preface to Marlowe's Works, ed. 1826; and *Quarterly Review.*)

MARLSTONE. Sandy, calcareous, and irony strata, which divide the upper from the lower lias clays, are thus designated. (GEOLOGY.) This mass of rocks is nowhere so well developed as in Yorkshire and Leicestershire.

MARLY. [SEINE ET OISE.]

MARMALADE, a sort of preserve, made with sugar and the Seville or bitter orange, a variety of the fruit of the Citrus Bigaradia. It is more wholesome when properly made, *i.e.* when the rind is soft, than most other sweet preserves, as the bitter communicates tonic and stomachic properties to it.

MARMANDE. [LOT ET GARONNE.]

MARMONTEL, JEAN FRANÇOIS, was born at Bort in Limousin, in 1723. His parents were of very humble condition, and he owed his instruction in the Latin tongue to the gratuitous tuition which he received in a college under the direction of the Jesuits. His father placed him with a tradesman at Clermont, but a love for literature interfered with all commercial pursuits. At an early age he became professor of philosophy at a seminary of the Bernardins at Toulouse, and supported his mother and family after the death of his father. An acquaintance with Voltaire, to whom he had sent some poems, and who encouraged his attempts, brought him to Paris in 1745. Voltaire introduced him to several persons of distinction, and the success of his first tragedy, 'Denys le Tyran,' stamped him as a dramatic poet. Owing to the patronage of Madame Pompadour he was made historiographer of the royal buildings (*Historiographe des Bâtimens du Roi*), with a pension of 1500 livres, and he also obtained the right of publishing the 'Mercure,' by which he gained 40,000 livres. He was falsely suspected of satirising a person of distinction, and in consequence lost the 'Mercure,' and was confined in the Bastile. His celebrated *Contes Moraux*—which, however dubious as to their moral character, are exquisite specimens of the lighter kind of French writing—followed his release, and gained him great reputation. On the death of Duclos he became Historiographer of France; and in 1783 he was made secretary to the Académie in the place of D'Alembert. He lost his appointments and his property on the breaking out of the Revolution, and he removed some distance from Paris in a state of destitution. In 1796 he became member of the National Institute, and in 1797 was elected into the council of the antients, but this election having been reversed after the 18th Fructidor (Sept. 4) in the same year, he retired to Abbeville, where he died in obscurity in 1799, and was buried in his own garden by Catholic priests.

The works by which Marmontel is chiefly known are his *Contes Moraux*, his romances 'Belisaire' and 'Les Incas,' and his 'Mémoires.' The 'Contes Moraux' and 'Belisaire' are so familiar in an English shape, that they are almost British classics.

MA'RMORA, or MARMARA, SEA OF, the *Propontis* of the antients, is situated between the Grecian Archipelago and the Black Sea, communicating with the former by the Dardanelles, the antient Hellespont, and with the latter by the strait of Constantinople, the antient Bosporus. Towards the east it terminates in the long and narrow gulf of Ismid, and towards the south-east in the gulf of Modanieh. These were respectively the Astacenus or Olbianus Sinus (after-the Gulf of Nicomedia) and the Cianus Sinus of the antients.

The early Greek geographers, more especially those before the time of Ptolemy, appear to have been very much mistaken respecting the general position of this sea. They represent its greatest length in a direction nearly north and south, instead of east and west, placing the Thracian Bosporus and the Hellespont on the same meridian. Eratosthenes however is thought to have possessed the requisite data for determining its great inclination from the west towards the east, having described the parallel of Amisus as passing through the Propontis and the Hellespont; and the reason assigned for his making no use of this knowledge is his unwillingness to depart from the prevailing opinion of the age in which he lived. Polybius also seems to have been aware of the inclination of the Propontis to the east.

Herodotus gives the length of the Propontis at 1400 stadia, and its breadth at 500 (iv., 85): he allows 400 stadia as the length of the Hellespont (Dardanelles). Strabo (p. 125, Casaub.) gives 1500 stadia as the length of the Propontis from Byzantium to the Troad, and reckons its breadth nearly the same. He also adopts the opinion of Pytheas as to its direction, placing the Hellespont and the Bosporus under the same meridian, and it is not until the time of Ptolemy that we find the Propontis beginning to assume an inclination from west to east, and even then the error in its position received but a slight correction.

Turning to our modern maps, the Sea of Marmora is comprehended between the parallels of 40° 18′ and 41° 5′ N. lat., and the meridians of 26° 40′ and 30° 5′ E. long. Its extreme length, from west to east, including the gulf of Ismid, is about 160 geographic miles; from strait to strait, in a west-south-west and east-north-east direction, 110 miles; and its greatest breadth is 43 miles.

Its shores are described by modern travellers as highly cultivated and picturesque, with a greater boldness of character on the Asiatic than on the European side.

The depth of this sea is in many parts very considerable. In the Admiralty Chart published in 1833 we find 133 fathoms about five miles north-east of Marmora Island, and about the same distance due north of it no bottom at 355 fathoms; from which we may infer that the depth is very much greater midway between the two shores.

Since there are no regular tides in the eastern basin of the Mediterranean nor in the Black Sea, they are much less to be expected in the Sea of Marmora. We accordingly find that there is no periodical ebb and flow of its waters; but a current sets through it from the Bosporus, varying its velocity according to the season and the prevailing winds, and continuing its course through the Dardanelles to the Archipelago. Its navigation is by no means difficult: it is generally free from dangers, and good anchorage may be found all along its northern shore, under its various islands, and inside the peninsula of Artaki.

The most remarkable islands in this sea are, Marmora (from which the sea takes its name), Rabi, and Liman-Pasha, occupying its western division; Papa, or Kalolimno, off the gulf of Modanieh; and the group called the Princes Islands, near the Asiatic shore, about ten miles south-east of Constantinople. The Princes Islands are nine in number, two of which, Oxeia and Rata, are uninhabited. Of the others, Prinkipos (the antient Pityusa) and Kalki (the antient Chalcitis) were once distinguished for their copper-mines. Their scenery is described as being very beautiful, and the Frank merchants of Pera and others have their summer residences on them.

The remarkable peninsula of Artaki was formerly an island, on which stood the once flourishing city of Cyzicus, the ruins of which are still to be seen, and which confirm the historical testimony of its opulence. The modern town of Artaki, which gives its name to the peninsula, and which is thought to occupy the site of the antient Artace, is not a town of much note. It is said to contain about 4000 inhabitants, and has some trade in wine, oil, and silk.

In addition to Constantinople, at the entrance of the Bosporus, and Gallipoli, at the entrance of the Dardanelles, the principal towns of the Sea of Marmora are, Rodosto, Erekli, and Silivri, on the northern, and Kemeris, Karabouga, Panorma, and Modanieh, on the southern shore. There is also Ismid, at the head of the gulf of that name, and Gumehlek, at the head of the gulf of Modanieh. The chief rivers which enter this sea are the Tchorlu and the Iatidji, in Europe, and the Ustvola (the antient Granicus), the Boklu, or Satalderé (the antient Æsepus), and the Mualitsh (the antient Rhyndacus), in Asia. There are two other rivers on the European side which appear to be of some importance; they are called Karasudere and Taslidere in the large map of European Turkey, Vienna, 1829.

MARMORA, or MARMARA (the antient Proconnesus), is an island in the sea above described. It was early celebrated for its marble quarries, from which Cyzicus and other neighbouring cities were supplied with materials for their edifices. (Strabo, p. 588.) More recently Constantinople has been indebted to these quarries for the emb lishment of its mosques, fountains, and other public b ings; but the marble is now principally used for sepulchral monuments of the Turks and Armenians is said to have abounded with deer, from which circumstance the Greek names Proconnesus and its earlier appellation Elaphonnesus are said to be derived.

It has a mountainous range of moderate height, has rather a sterile aspect, and is poorly inhabited. The chief town, which is also called Marmora, is situated on its south-west side, and is built of wood. The island has several villages, and its inhabitants are chiefly Greek Christians.

MARMORA, a town of Asiatic Turkey, in the province of Anatolia, in 28° 43′ N. lat. and 28° 5′ E. long.

MARMOT. [MURIDÆ.]

MARNE, a river in France belonging to the system of the Seine, which it joins just above Paris. [SEINE.]

MARNE, a department of France, bounded on the north by the department of Ardennes, on the east by that of Meuse, on the south-east by that of Haute Marne, on the south by that of Aube, on the south-west by that of Seine et Marne, and on the west and north-west by that of Aisne. Its form is irregular. The greatest length is from north-west to south-east, from the neighbourhood of Fismes on the Vesle to the neighbourhood of St. Dizier (Haute Marne) on the Marne, 74 miles; its greatest breadth, at right angles to the length, is from the village of Petit St. Hilaire on the Suippe to the bank of the Seine, near the junction of the Aube, 62 miles; the area is estimated at 3158 square miles, an area exceeding that of any English county except Yorkshire, and exceeding by above 100 square miles that of the two counties of Essex and Suffolk. The population, in 1831, was 337,076; in 1836, 345,245, showing an increase in five years of 8169, or about 2·5 per cent., and giving 109 inhabitants to a square mile. In amount of population it is very far below the two English counties with which we have compared it, not very much indeed surpassing the single county of Essex, the more populous of the two. In density of population it is far below the average of France, and below every English county except Westmoreland. Châlons sur Marne, the capital, is in 48° 57′ N. lat. and 4° 21′ E. long., 89 miles in a direct line east of Paris, or 102 miles by the road through Meaux, Château-Thierri, and Epernay.

The department consists of extensive plains, or of undulating or hilly tracts, in which the greatest elevations do not exceed 1200 feet above the level of the sea. The general inclination of the surface is toward the west and north-west, in which directions the waters flow. The western side of the department is occupied by the supracretaceous formations of the Paris basin, and the rest of the department by the chalk itself, except just along the eastern border, where the formations that underlie the chalk crop out. The mineral treasures consist in quarries of freestone for building, and of stone from which the best millstones in Europe are made, fine sand in much request for glass-works, and potters' earth. Peat is dug in considerable quantity, especially in the valley of the Vesle; about 1000 tons of potters' earth are sent yearly to Paris, or into the departments of Meurthe and Aisne. The millstones of this department are sent into the east and south of France, and even into Germany. About 1000 tons of rough chalk and 1500 tons of refined chalk are sent yearly to Paris, or into Lorraine, Alsace, and Germany. Near Vitry is a bed of considerable thickness of sulphureous ashes, which however are not wrought, at least to any extent. There are several mineral springs: those of Sermaize on the Saulx, near the eastern boundary of the department, are in the highest repute.

The rivers all belong to the system of the Seine, in the basin of which the whole department is included. An arm of the Seine, called the 'Canal Sauvage,' and the main stream of the river itself, just touch the southern border of the department, which they separate for seven or eight miles from the department of Aube. The Aube has a small part of its course in this department, on the border of which it joins the Seine. The Auges joins the Aube. The Marne enters this department in the south-east, from the department of Haute Marne, and flows through it in a channel the direction of which bends gradually from north-west to west. It receives on its right bank the Orne or Ornain (into which fall the Saulx and the Chée), and several other smaller streams. The Morin, the Petit Morin, and the Melun or Sumerlin rise in this department, but join the Marne beyond the boundary. The rivers in the north and north-east are the Aisne, a principal feeder of the Oise, and the Suippe and the Vesle, feeders of the Aisne. The inland navigation of the department is thus stated in the government returns:—Seine, 3 miles; Aube, 9 miles; Marne, 102 miles: total, 114. None of the other rivers are navigable, and there are no canals.

The number of government roads is eight: they had (in Jan., 1837) an aggregate length of 364 miles, viz. 238 miles in repair, 99 out of repair, and 27 unfinished. The principal road is that from Paris, by Dormans and Epernay, to Châlons, from which place one branch runs by Ste. Ménéhould to Verdun and Metz, and from thence to Mayence or Mentz, and Frankfort in Germany; the other to Vitry, Bar le Duc, Nancy, and Strasbourg. The great road from Paris to Mezières, and so to Namur and Liège in Belgium, passes through Fismes and Reims. Another road from Paris to Châlons branches off from the great road at La Ferté-sous-Jouarre (Seine et Marne), and passes through Montmirail; and a road from Paris to Vitry passes through Coulommiers (Seine et Marne) and Sezanne. Roads from Châlons lead to Reims and Laon (Aisne), and to Arcis-sur-Aube and Troyes (Aube); and a road from Reims leads by Epernay and Sezanne to Nogent-sur-Seine (Aube). The departmental roads were fifteen in number (Jan., 1837), and had an aggregate length of 289 miles, viz. 113 in repair, 50 out of repair, and 126 unfinished. The bye-roads and paths amounted to above five thousand.

The soil of the department varies greatly: nearly two-thirds consist of chalky plains covered with a thin layer of vegetable, often sandy, soil, producing good crops of grain, but scarcely admitting the growth of trees, except Scotch firs, and other trees of similar kind, which have lately been planted to a great extent. In the southern parts of the department these chalky plains are so desolate as to have incurred in former times the reproachful epithet of 'Champagne Pouilleuse.' The kinds of grain chiefly cultivated are wheat, barley, and oats (in all of which the produce is considerably above the average of France), and especially rye and maslin, or mixed corn. Vegetables, fruit of excellent quality (especially the melons of Châlons), and mushrooms, are grown; flax, hemp, and oleaginous plants are pretty generally cultivated, and the osier-beds are extensive. About 250 tons weight of rape, linseed, or other vegetable oils are sent yearly from Châlons to Paris, Lyon, and Reims. Champagne wine is however the staple production of the department: it is distinguished as *vin de rivière* (wine of the river), and *vin de montagne* (wine of the hills), the first growing on or near the banks of the Marne, and being chiefly white—the second at a distance from that river, and being chiefly red. The vineyards occupy an extent of from 45,000 to 50,000 acres: the wines are sparkling or creaming, and still. The proportion of sparkling or creaming wine has much increased of late years. The best growths of the vin de rivière are from the right bank of the Marne in the neighbourhood of Epernay. Of these the wines of Ay, Mareuil, and Hauvilliers have the highest reputation. The best vin de montagne are the white wines of Sillery, and the red wines of Ambouay, Verzy, Verzenay, and other places in the arrondissement of Reims. About three-fourths of the sparkling and creaming wines of Champagne are exported to Italy, Switzerland, Germany, Poland, Russia, and England. The red wines are sent to Paris, and into the departments of Somme, Aisne, Ardennes, and Nord. The woodlands are extensive: the chief trees are the oak, the birch, and the various species of pine and fir. Charcoal is made near Sainte Ménéhould, and sent to Paris.

The meadow and pasture lands occupy 95,000 to 100,000 acres. A great number of horses are bred, but the quantity of horned cattle is below the average of France. There are numerous flocks of sheep of various breeds, merinos, English and native; and the Tibet goat has been introduced of late years. The quantity of wool grown is below the average of the departments of France. Bees are numerous; and the streams and ponds of the department abound with fish.

The department is divided into five arrondissements, as follows:—

Name.	Situation.	Area in Sq. Miles.	Population in 1831.	1836.	Communes.
Châlons	Central	627	48,099	48,535	109
Epernay	S.W.	818	83,278	86,452	185
Reims	N.W.	685	120,680	123,919	181
Ste. Ménéhould	N.E.	428	34,952	35,812	82
Vitry	S.E.	600	50,067	50,527	133
		3158	337,076	345,245	690

There are thirty-two cantons or districts, each under a justice of the peace.

In the arrondissement of Châlons are Châlons-sur-Marne (pop. in 1831, 12,413; in 1836, 12,952), [Chalons], on the Marne; and Suippe or Suippes (pop. 2324), on the Suippe. The long village of Courtisols, or Courtisou, on the road from Châlons to Ste. Ménéhould, consists in fact of three villages, forming two parallel streets or roads, and extending in all about five or six miles. They have about 2000 inhabitants, distinguished from the surrounding population by their peculiar dialect, customs, and agricultural skill, circumstances which have been the subject of much antiquarian conjecture. Near the village are the traces of a Roman road and of the camp of Attila.

In the arrondissement of Epernay are Epernay (pop. in 1831, 5318; in 1836, 5457), [Epernay]; Damerie and Dormans, on the Marne; Orbais, on the Sumerlin; Montmirail (pop. about 2000), on the Petit Morin; Sézanne and Courgivaux, near the Morin; Anglure, on the Aube; Fère Champenoise (pop. 2049), on a branch of the Auges; Barbonne, Vertus, Avize, and St. Martin d'Ablois. Dormans is in a district producing excellent wine. The inhabitants carry on a considerable trade: oats, timber, and charcoal are sent down the Marne to Paris and Meaux, and gypsum is brought up that river from Château-Thierri. Spinning and weaving are carried on, and tiles and pottery of good quality are made near Dormans, which is also the mart for linens made in the neighbourhood. Montmirail was the scene of one of Bonaparte's victories over the allies in the hard-fought campaign of 1814. Millstones are quarried in the neighbourhood. Sézanne (pop. above 4000 in 1827) was once a place of greater consequence. It was taken by the English, destroyed by the Protestants under Charles IX., and consumed by fire in 1632. It is now the seat of considerable trade in agricultural produce. At St. Martin d'Ablois millstones of inferior quality are produced, and paper and cardboard or pasteboard manufactured. Vertus and Avize are in the midst of vineyards, which produce excellent wine. Fère Champenoise suffered much in the campaign of 1814.

In the arrondissement of Reims are Reims (pop. in 1831, 35,971; in 1836, 38,359), [Reims], and Fismes (pop. 1962 town, 2110 whole commune), on the Vesle: Cormicy, in the country north of that river; and Mareuil, Ay (pop. about 2500), Avenay, and Châtillon-sur-Marne, on or near the Marne. Fismes was the birth-place of Velly, one of the best of the French historians: the inhabitants manufacture coarse woollens. Ay and Mareuil are surrounded by vineyards, producing some of the best wine in the department.

In the arrondissement of Ste. Ménéhould are Ste. Ménéhould (pop. in 1836, 3962 for the commune), and Vienne le Château, on or near the Aisne. The former is a regularly built town, with houses of brick and stone, and a town-hall of elegant architecture. The manufactures of the town, pottery, glass, and leather, are inconsiderable; but a good deal of fruit is grown in the country round. Ste. Ménéhould was the first place besieged by Louis XIV., who entered it through the breach. Louis XVI. was recognised here in attempting to escape from France.

In the arrondissement of Vitry are Vitry (pop. in 1831, 6976; in 1836, 6822), on the Marne; and Heiltz-le-Maurup and Sermaize (pop. 1790), on or near the Orne, or Ornain. Vitry arose from the ruins of another town of the same name in the immediate neighbourhood, now a village distinguished as Vitry-le-Brulé. This antient Vitry was taken by Louis VII. le Jeune, from Thibaud, count of Champagne; and as he scrupled to stain the church with the blood of thirteen hundred people who had taken refuge in it, he ordered the edifice to be set on fire, and the unhappy fugitives to be burnt alive. From this detestable act the place acquired its surname 'le brulé,' or 'the burnt.' The ill-fated town was subsequently burnt by Jean of Luxembourg, and entirely ruined by the army of the emperor Charles V. After this last catastrophe Francis I. determined to rebuild it, but not on the same site. The new town, distinguished by the name of Vitry-le-François (not le Francais), or Vitry-sur-Marne, rose on the bank of the Marne. It has broad and straight streets; and the houses, though built of wood, are respectable. It was intended to fortify the town, but it has never had any better defence than an earthen rampart and a ditch. There are a considerable number of manufactories of hats, cotton yarn, and cotton hose. There are also some oil-presses. There are extensive nursery-grounds round the town; and in the arrondissement strong hemp is grown, which is sent to Paris and the department of Seine Inférieure by the Aube and Marne. Sermaize has mineral springs, which are in tolerable repute.

The population, when not otherwise specified, is that of the commune, and is chiefly taken from the returns of 1831.

The manufacturing industry of the department is considerable. Wool-combing or carding, spinning, weaving, dyeing, and the other processes connected with the manufacture of woollen cloths, kerseymeres, flannels, blankets, merinos, shawls, and other woollen goods, and some cotton goods, are carried on to a considerable extent in the districts of which Reims is the centre. Many of these processes are carried on by the workmen and their families on their own account. It is not many years since the factory system was introduced at Reims; before that, the same room served for the dwelling-place and workshop of the manufacturer. Some linens and silks are made; also leather, earthenware, wax candles, soap, cutlery, hats, and paper. The exports, both of agricultural produce, especially corn, wine, and oil, and of manufactured goods, are considerable. They are sent down the Marne from Vitry, Châlons, Epernay, and Dormans.

The department of Marne is divided between the diocese of Châlons, which comprehends the arrondissements of Châlons, Epernay, Vitry, and Ste. Ménéhould; and the archdiocese of Reims, which comprehends the arrondissement of Reims, with the adjacent department of Ardennes. The bishop of Châlons is a suffragan of the archbishop of Reims. The department is included in the jurisdiction of the Cour Royale and the circuit of the Académie Universitaire of Paris. It is included in the second military division, of which the head-quarters are at Châlons. It returns six members to the Chamber of Deputies.

The state of education in this department is considerably above the average of France; it ranks as the tenth department in this respect. The number of those enrolled in the military census of 1828-9 who could read and write was sixty-three in every hundred, the average of France being thirty-nine.

This department was comprehended at the time of Cæsar's invasion of Gaul in the territories of the Suessiones, or Suessones (*Σουεσσίονες* and *Σουεσσῶνες*, Strabo), the Remi (*'Ρημοὶ*, Ptol. and Strabo), and the Catalauni, confederated Belgic tribes; and of the Tricasses, a Celtic people. In the Roman division of the country the Belgic tribes were comprehended in the province of Belgica Secunda; the Tricasses in that of Lugdunensis Quarta or Senonia. Several Gallic or Roman towns were included in its limits; as Durocortorum, capital of the Remi, afterwards called Remi, now Reims; Basilia, perhaps Baconne, between the Vesle and the Suippe, in the territory of the same people; Fines, now Fismes, on the frontier between the Remi and the Suessiones; Duro Catalaunum, capital of the Catalauni, afterwards called Catalauni, and now Châlons; Fanum Minervæ, near Le Cheppe, on a feeder of the Vesle, and Ariola, now Vroil, near the Ornain, in the territory of the same people; and Bibe, perhaps St. Martin d'Ablois, in the territory either of the Catalauni or the Suessiones. In the downfal of the Roman empire this department was the scene of contest between Ætius, the Roman general, with his allies, the Franks, Burgundians, and Visigoths; and Attila, king of the Huns, with his allies, the Alans, the Gepidæ, and the Ostrogoths. The defeat of Attila at Châlons led to the evacuation of Gaul by him. Subsequently the department became subject to the Franks of Austrasia, and in the feudal ages formed part of the county of Champagne, which came, in 1335, into the hands of Philippe VI. de Valois, and in A.D. 1361 was formally united to the French crown by Jéan II. In the campaign of 1792 this part of France was the scene of contest between the Austrian and Prussian forces under the duke of Brunswick, and the French under Dumourier and Kellerman; and in the campaign of 1814, between the Russian and Prussian forces under Blucher, and the French under Napoleon and his generals.

MARNE, HAUTE, a department in the north-eastern part of France. It is bounded on the north-east by the department of Meuse, on the east by that of Vosges, on the south-east by that of Haute Saône, on the south-west by that of Côte d'Or, on the west by that of Aube, and on the north-west by that of Marne. Its form approximates to an oval, having its greatest length from north-north-west, near St. Dizier, to south-south-east in the neighbourhood of Fay-le-Billot, 80 miles; and its greatest breadth, at right angles to the length, from the neighbourhood of La Ferté-sur-Aube to that of Bourmont, on the Meuse, 48 miles. Its area is estimated at 2420 square miles, which is rather less than that of the English county of Devon, or rather more than the conjoint area of the two counties of Wilts and Dorset. The population, in 1831, was 249,827; in 1836 it was 255,969, showing an increase in five years of 6142, or about 2·5 per cent., and giving about 106 inhabitants to a square mile. In amount of population and in density of population it is to the average of the French departments in the proportion of 2 to 3, and falls very far below the English counties with which we have compared it. Chaumont, the capital, is in 48° 7′ N. lat. and 5° 9′ E. long., 135 miles in a direct line east-south-east of Paris, or 148 miles by the road through Provins, Troyes, and Bar-sur-Aube.

The department is hilly, and even mountainous in the southern and eastern parts. The heights of Langres and the Faucilles mountains, which constitute a continuous range, and form part of the chain that unites the Cévennes with the Vosges, cross the department in a north-eastern direction near the south-eastern boundary. Lateral branches from this main range run to the north-west, separating the valleys watered by small streams belonging to the system of the Seine; and near the eastern extremity of the department a more important lateral branch runs in a northern direction, separating the basin of the Meuse from that of the Seine. The summits of the main ridge are not very lofty, scarcely rising in any instance to more than 1600 feet. The strata which intervene between the chalk and the saliferous sandstone occupy the whole of the department. The mineral treasures are, iron in abundance in the centre and northern parts; freestone, which bears a fine polish, whetstones, gypsum, brick earth, fullers' earth, and marl. There are many turf-pits, and several mineral springs, of which those of Bourbonne-les-Bains are in the highest repute. The heights of Langres with the Faucilles, and the principal lateral branch from them, divide the department between the three great slopes, the Western or oceanic, the Rhenish, and the Mediterranean. [France.] The central, northern, and western parts belong to the oceanic slope, and are included in the basin of the Seine. Most of the streams which water this part rise on the north-western slope of the heights of Langres, and have a north-western course. The source of the Ource, one of the earlier feeders of the Seine, is just within the western boundary; next to it are those of the Aube, and its feeder the Aujon; and then those of the Marne with its feeders, the Sure, the Treyre, and the Rognon. The Marne, the most important of these streams, flows through the department in nearly its whole length, receiving by the way the above-mentioned tributaries, and becoming navigable just before it quits the department. The Blaise, another tributary of the Marne, rises at the foot of the heights of Langres, and waters the western side of the department, but does not join the Marne within the boundary. The Voire, a tributary of the Aube, waters the north-western parts. The eastern side of the department belongs to the Rhenish slope, and is comprehended in the basin of the Meuse, which has its source and a small part of its course within the boundary. The south-eastern part belongs to the Mediterranean slope, and is comprehended in the basin of the Rhône. It is watered by the Vingeane, the Saulon, and the Amance, feeders of the Saône, which rise on the south-eastern slope of the heights of Langres. There are few lakes or pools: the only marshes are in some parts of the valleys of the Meuse and the Amance. The only inland navigation is that of the Marne, about seven or eight miles long.

There are only six Routes Royales, or government roads, having an aggregate length of 253 miles; viz. 174 in repair, 78 miles out of repair, and 1 mile unfinished. The principal road is that from Paris to Bâle, which enters the department on the west and passes south-east through Chaumont, Langres, and Fay-le-Billot. The road from Paris to Bar-le-Duc and Strasbourg just crosses the northern corner of the department through St. Dizier, from whence a road follows the valley of the Marne through Joinville and Vignory to Chaumont. A road from Langres leads to Dijon (Côte d'Or), sending off a branch road by the way to Gray (Haute Saône) and Besançon (Doubs): another road from Langres leads along the valley of the Meuse to Neufchâteau (Vosges); and a road from Troyes (Aube) to Toul and *Nancy (Meurthe)* crosses the department through Doulevant and Joinville. There are several departmental roads, of which about 136 miles are in repair. There are a great number of bye-roads and paths, with an aggregate length of above 4000 miles.

The soil of the department varies much, but is on the whole fertile: the vegetable soil rests chiefly on a calcareous subsoil. There are fertile plains, beautiful valleys, and well wooded heights; with here and there naked and barren rocks. Agriculture has undergone considerable improvement; the marshes and other tracts previously uncultivated have been for the most part turned to good account. More than half the soil of the department is under the plough. The quantity of wheat and of buckwheat grown, though below the average of the departments of France if quantity alone be considered, is considerably above the average if taken in relation to the population; the quantity of rye and maslin, and of potatoes, is far below the average, however regarded; that of barley and of oats nearly twice the average. Pulse, rape, and mustard are grown; together with a considerable quantity of gentian and other medical herbs. Walnut-trees and cherry-trees are numerous. The cultivation of the vine is an object of considerable attention: the vineyards cover 32,000 or 33,000 acres, and are remarkably productive. The wines of Aubigny and Montsaugeon, on the south-eastern slope of the heights of Langres, are red wines of the first class; those of Vaux, Rivière-les-Fosses, and *Prautboy* are among the best of the second class. The *grass lands* constitute about one-tenth of the department; more than half of them are meadows, the rest are heaths or commons, or other open pastures. The number of horses reared is very great. They are of small size and middling quality. The number of horned cattle is about equal to that in the average of the departments; but relatively to the population is above the average. Cows predominate and are considered excellent milkers. The sheep are much esteemed for their flesh; but the quantity of wool grown is not considerable. Goats are numerous; but pigs not so. Bees are very generally kept, and in some places a great number of turkeys are reared. The rivers and pools yield fish and crayfish; small game is abundant; and the forests and mountains are the haunts of the wild boar, the wolf, the fox, the roebuck, and the stag.

The woodlands are extensive, and their produce forms an important article of export. The chief timber is oak and beech. It was estimated twelve years ago that above 30,000 tons of firewood, and 15,000 tons of timber, both of oak, were yearly sent down the Marne to Paris; 10,000 tons of ship timber and 1,200,000 deals, of the weight of 12,000 tons, with 2500 tons of fir poles with the bark on, were also yearly sent down the Marne from St. Dizier, chiefly to Paris. The exportation of timber and faggots from the department has probably increased since that period, with the growth of the population of Paris.

The department is divided into three arrondissements, as follows:—

Name.	Situation.	Area in sq. miles.	Population in 1831.	1836.	Communes.
Chaumont	Central	967	84,965	87,271	195
Langres	S.E.	838	98,422	100,528	210
Vassy	N.W.	615	66,440	68,170	145
		2420	249,827	255,969	550

There are twenty-eight cantons or districts, each under a justice of the peace.

In the arrondissement of Chaumont are Chaumont, distinguished as Chaumont en Bassigni (pop. in 1831, 6104 town, 6318 whole commune; in 1836, 6318 for the commune) [Chaumont], and Vignory, on or near the Marne; La Ferté-sur-Aube on the Aube; Arc-en-Barrois and Château-Vilain on the Aujon; Nogent-le-Roi on the Treyre; Andelot on the Rognon; Bourmont on the Meuse; and Reynel and Saint Blain between the Rognon and the Meuse. There are iron-works at La Ferté. Château Vilain (with a population amounting probably to nearly 2000) also has some iron-works; and the inhabitants manufacture black calf-skin. Nogent-le-Roi (pop. 2314 town, 2401 whole commune) has a considerable manufacture of cutlery. Bourmont (with a population scarcely exceeding 1000) is the centre of a district in which the same manufacture is carried on to a considerable extent. The town is delightfully situated, and commands an extensive view of the valley of the Meuse: it has a public library.

In the arrondissement of Langres are Langres (pop. in 1831, 5960 town, 7460 whole commune; in 1836, 7677 whole commune [Langres], near the source of the Marne; Fay-le-Billot (pop. 2321 town, 2411 whole commune), near the source of the Saulon; and Bourbonne-les-Bains [Bourbonne-les-Bains] on a feeder of the Saône. Fay-le-Billot has bleaching-grounds; the inhabitants carry on trade in basket-work and leather.

In the arrondissement of Vassy are Vassy (pop. in 1831, 2333 town, 2583 whole commune; in 1836, 2694 commune). Doulevant and Eclaron on the Blaise; Sonnevoire and Montierender on the Voire; and St. Urbain, Joinville (pop. 3015 town, 3035 whole commune), and St. Dizier (pop. 5957 town, 6197 whole commune), on or near the Marne. Vassy, or Wassy, is known in history for the collision which took place between the retinue of the duke of Guise and a Huguenot congregation, which led to the massacre of many of the latter, and was the immediate cause of the religious wars of the sixteenth century in France. The manufactures of the town are yarn, druggets, woollen cloths, nails, and leather. The neighbourhood abounds with iron-works. Sonnevoire, or Sommevoire, has a small woollen manufacture. Joinville has its antient castle, in which were born the Sieur de Joinville, companion and historian of St. Louis in his crusade, and the cardinal of Lorraine, brother of the duke of Guise. Woollen and cotton yarn, and worsted stockings, are made here. At St. Dizier the navigation of the Marne commences. The timber and iron of the department, and the iron of the adjacent department of the Meuse, are deposited in stores here, previous to their being put in boats for Paris, or forwarded by land carriage, one part to Paris, another to Flanders. Boat-building is actively carried on here; a hundred boats, each of 100 tons burden on the average, are yearly built. Nails and tires for wheels are also manufactured. The town is pleasantly situated, well built, and surrounded with public walks. There is a handsome townhall lately built. Two engagements were fought near this town in 1814, between the French and the allies.

The manufactures of the department are considerable, though checked by the insufficiency of the means of transport. That of iron is the chief. There were in 1834, 71 iron-works of different kinds, with 58 furnaces for producing pig-iron and 124 forges for wrought-iron. Charcoal was the universal fuel. A considerable quantity of fine cutlery is made at Langres, Chaumont, Bourmont, and Nogent-le-Roi; nails, files of every description, iron pipe, and other hardwares; wax candles, paper, leather, gloves, glass, porcelain, stockings, knit and woven, and some woollen cloths are also manufactured. The exports are manufactured goods as above, wax, corn, wine, and timber.

The department constitutes the diocese of Langres, the bishop of which is a suffragan of the archbishop of Lyon et Vienne: it is in the jurisdiction of the Cour Royale and the circuit of the Académie Universitaire of Dijon; and in the eighteenth military division, the head-quarters of which are at Dijon. It returns four members to the Chamber of Deputies.

In respect of education this department is one of the most advanced. It is exceeded only by the three departments of Meuse, Doubs, and Jura. Of every hundred young men enrolled in the military census of 1828-29, seventy-two were able to read and write; while on the average of the whole of France the number was only about thirty-nine.

This department originally constituted part of the territories of the Lingones, a Celtic people; and of the Catalauni and the Leuci, Belgic nations. In the Roman division of Gaul, the Lingones were included in the province of Lugdunensis Prima; the Leuci in that of Belgica Prima; and the Catalauni in that of Belgica Secunda. The limits of the present department included the towns of Andematunum, the capital of the Lingones, afterward called Lingones, now Langres; and of Aquæ Borvonis, now Bourbonne-les-Bains, also in the territory of the Lingones. On the downfal of the Roman empire this district came into the hands of the Burgundians and of the Franks; and part of it was comprehended in the county, afterwards duchy, of Langres in Champagne, united to the crown A.D. 1179. Another part formed a detached portion of Le Barrois.

MARNES IRISE'ES. The French geologists intend by this term to designate the upper party-coloured 'marls' or clays of the new red formation. In Germany these are the Keuper marls, and in England the gypseous and saliferous marls of Cheshire, Worcestershire, Nottinghamshire, &c. (See Sedgwick on 'Magnesian Limestone,' in *Geol. Trans.*; Murchison's *Silurian System*, &c.)

MAROCCO, called by the natives Mogh'rib-el-acsà ('the farthest west'), or briefly Mogh'rib, whence the inhabitants are called Moghribins, is an empire in Northern Africa, which extends from south to north between 27° and 36° N. lat., the most northern districts forming the southern coast of the Straits of Gibraltar, and from east to west between 1° 20′ and 11° 30′ W. long. On the north it borders on the Mediterranean, on the north-west and west on the Atlantic Ocean, on the south on the Sahara, and on the east on Algiers. Its surface is estimated by Graberg at 274,000 square miles, or about 50,000 square miles more than that of France.

Surface and Soil; Coast.—The surface of this extensive country is extremely diversified by mountains, hills, plains, and valleys. The Atlas traverses it in its greatest length, running, at some distance from its southern and eastern boundary, from Cape Nun on the Atlantic Ocean, to Cape dell' Acqua, west of the mouth of the river Mulwia, on the Mediterranean. The general direction of the Atlas is from south-west to north-east; south of 32° it is called the Greater Atlas, and north of it the Lesser Atlas. [Atlas.] The Greater Atlas, towards its southern extremity, consists of two ranges, both beginning near the Atlantic; the southern, commencing at Cape Nun (south of 29°), is called Mount Adrar, and the northern, commencing at Cape Gher (south of 31°), or Ras Aferni, bears the name of Mount Bebauan. The two ranges unite about 31° N. lat., and about 100 miles from the shore. Between these two ranges is the plain of Tarudant, or Sus-el-acsà. Both the ranges, as well as the remainder of the Greater Atlas, are covered with snow for several months in the year, but probably none of the summits attain the limits of perpetual congelation. The Greater Atlas is not very wide, being generally traversed in two or three days. Two mountain-passes lead over Mount Bebauan, one called Bebauan, not far from Cape Gher, and another called Belavin, about 60 miles farther east, which connects the town of Tarudant with Fruga, in the plains of Marocco. A third pass is stated by Caillié to lead from the town of Tatta in Drah, or Daraa, to the town of Marocco; but it has never been traversed by Europeans. The interior of the range consists of ridges and valleys, and sometimes also mountain-plains: it is well cultivated in some parts, and in others it serves as pasture-ground: towards the southern declivity it is nearly a bare rock.

Between 31° and 32° N. lat., and near 5° W. long., where the range turns more to the north, and takes the name of the Lesser Atlas, the width of the range increases considerably, and as most of the large rivers rise in this part of the Atlas, it was thought that the highest summits also occurred here: some were said to rise to 13,000 feet and upwards, but Caillié, who seems to have traversed this tract in an oblique direction, on his return from Timbuctoo, does not mention any elevated summits, nor does he speak of having seen snow on the mountains. The Lesser Atlas, though, according to appearances, much less elevated than the Greater Atlas, probably occupies a greater width, sending lateral branches to the east and west, between which there are fertile valleys. Near 34° N. lat. and 4° W. long. the Lesser Atlas divides into two branches, of which the eastern runs north-east and terminates at Cape dell'Acqua; the other, called Er-Riff, turns first north-west, then west, and again north-west, until it terminates in the high and mountainous coast which forms the southern shores of the Straits of Gibraltar, between Punta di Africa, near Ceuta, on the east, and Cape Spartel on the west. The country which is included between these two lateral ranges of the Lesser Atlas and the Mediterranean Sea is the most extensive mountain-region in Marocco. Though the mountains do not rise to a great elevation, the whole tract is covered with masses of bare rock, with narrow valleys between them. The whole coast-line along the Mediterranean, which from Twunt, or Tawunt, to Cape Spartel is about 320 miles, is high and rocky. Level tracts of inconsiderable extent occur at the mouths of the small rivers only. Mount Abyla, or the Monkeys' Hill, opposite the rock of Gibraltar, rises to a considerable height.

The elevated and rocky coast continues along the Atlantic nearly as far south as the mouth of the river El Kos, or Luccos. The country adjacent to the coast is rather hilly than mountainous, though a few rocky masses rise to 2500 feet; the soil is mostly gravelly, and sustains only a scanty vegetation, with a few trees. The river (wadi) El Kos traverses an immense plain called M'shiara-er-Rumla, which extends eastward to the ranges of the Lesser Atlas, and southward to the banks of the river Seboo. Its surface is partly level, and partly traversed by low ranges of hills. Its slope towards the Atlantic appears to be gradual, as the rivers make numerous bends in the plain and have a gentle course. On its western border the sea has formed a range of sand-hills, by which several small rivers are prevented from reaching the ocean, and form along the shores two lakes, the smaller of which, Muley Buselham, is 5 miles long, and the larger, Murja Ras el Dowla ('the lake with the winding head'), 20 miles long by one and a half broad. The range of sand-hills which separates these lakes from the sea is about 250 feet high. The harbours along this low coast are nearly filled up with sand, and can only be entered by small vessels. The plain of M'shiara-er-Rumla, though the soil is light, is very productive in corn, and contains excellent pasture-grounds. It is also connected on the east with the fertile valley that extends east of the town of Fez, between the offsets of the Lesser Atlas.

The plains continue south of the Seboo river to the banks of the Oom-er-begh, or Morbeya, and still farther south; but they gradually change their character, and their fertility greatly diminishes. The country also rises from the sea-shore, which in many places is rocky and inaccessible, and extends in wide plains ascending like terraces one above the other, the eastern being always some hundred feet higher than that immediately west of it, until at the base of the Lesser Atlas they probably attain an elevation of 4000 feet. The inferior fertility of these plains seems to depend more on the climate than the soil, which chiefly consists of a light loam. Water is found only at the depth of from 100 to 200 feet. The rivers run in channels several feet below the surface of the plains. Only isolated spots are cultivated, and there are no trees except stunted palms.

A range of hills, rising between 500 and 1200 feet above the plains, divides them from the southern plain, which extends along the base of the Greater Atlas. Where the town of Marocco is situated, from which it obtains the name of the Plain of Marocco, it is about 25 miles wide, but it grows still wider as it advances westward. This plain, which is drained by the river Tensift, is about 1500 feet high near the town; but it grows lower towards the sea, and terminates, between Cape Cantin and Mogadore, in a low shore, generally sandy, and sometimes rocky. In fertility it is much superior to the central plains.

The plain of Tarudant, which is the most southern, lies between the ranges of the Bebauan and Adrar mountains. It appears to be traversed nearly in the middle by a range of hills which divide it into two wide valleys. The northern, which alone has been visited by Europeans, is level, and of great fertility, as the extensive woods and plantations of olive-trees show, but the greater part of it is uncultivated.

The countries east of Mount Adrar and south of the Greater Atlas are known under the names of Draha or Daraa, Tafilet, and Segelmesa, and are parts of the Bilud-ul-Gerid, or the 'country of the palms.' They have not been visited by any European except Caillié, who represents them as situated within the range of the Atlas, and as consisting of valleys and small plains, enclosed by low and sterile hills. The valleys and plains are also frequently rocky, and exhibit a scanty vegetation; but some parts are cultivated or covered with extensive groves of date-trees.

That portion of the empire of Marocco which lies on the east of the Lesser Atlas, and comprehends the basin of the river Mulwia, has never been visited by Europeans. According to Graberg, the southern part of it, near the sources of the river, contains some fertile plains or valleys, which are good pasture-grounds; but the northern districts are said to be occupied by two sterile regions, the deserts of Aduhra and Angad.

Rivers.—The Mulwia, or Muluya, which rises at or near the southern extremity of the Lesser Atlas, and runs northward into the Mediterranean Sea, has a course of about 400 miles; but as it traverses a country which has not been visited by Europeans, its peculiarities are not known. It is the only considerable river in Marocco which falls into the Mediterranean. Seven rivers fall into the Atlantic Ocean. The most northern, the El Kos, or Luccos, rises in the range of Er-Riff, and in its course of nearly 100 miles is used to fertilise the adjacent country by irrigation. Farther south is the Seboo river, which rises in numerous branches on the western declivity of the Lesser Atlas, and is joined by several affluents which descend from the southern declivity of the range of Er-Riff. After a course of about 230 miles it enters the Atlantic, near the town of Mehedia. Though a considerable river, with rather a large volume of water when compared with other rivers of this country, its mouth does not afford a harbour; a bar of sand, a quarter of a mile from its outlet, extends almost across, and is nearly dry at low-water of spring-tides. Inside the bar there are from three to four fathoms water, and the tide rises seven or eight feet. The waters are used for irrigating the adjacent country.

Bu Regreb is an inconsiderable river running hardly more than 100 miles; but its waters are used for irrigation, and its mouth forms the harbour of the towns of Salé or Sla, and Rabatt or Arbat. A bar, about one-eighth of a mile from the entrance, runs almost across in a west-south-western direction, with three or four feet water on it at low-water, leaving a channel at each end. The north-eastern channel is that which is used. The tide rises from nine to ten feet; inside, the harbour is sheltered, and has sufficient water for a frigate.

The Oom-er-begh, or Morbeya, the largest of the rivers that fall into the Atlantic, likewise rises in several branches in the western declivity of the Lesser Atlas, and probably runs more than 300 miles. In the upper part of its course it fertilises several valleys; but in its course through the plains it flows between high banks of sandy clay, and cannot be used for the purpose of irrigation. At its mouth is the small town of Azamor, which has no commerce: a bar of sand which lies across the mouth of the river is almost dry at low-water, and boats alone can enter it.

The Tensift, which waters the plain of Marocco, rises in a subordinate range of high hills, about 40 miles east of the town, and runs nearly 150 miles with a winding course. It is very probable that the mouth of this river also is closed by a bar.

Through the plain of Tarudant, or Sus-el-acsà, flows the river Sus, which rises in Mount Bebauan, north-east of Tarudant, and flows westward to the sea, which it enters at some distance south of the harbour of S. Cruz, or Agadir. It may be considered as the southern boundary of the empire, the Arabian chiefs who govern the country south of it being only nominally subject to the emperor of Marocco.

The most southern river which falls into the Atlantic is the Draha, or Daraà. Until lately it was supposed that this river was lost in the moving sands of the Sahara; but according to the statement of Wilkinson (*London Geographical Journal*, vii.), it reaches the sea 32 miles south-west of Cape Nun, where it is called on our maps Akassa. If this statement is true, the Draha, which rises on the southern declivity of the Greater Atlas, south-east of the town of Marocco, must have a course of more than 500 miles; but nearly the whole of it is unknown. It is however said that it flows through the productive districts of Draha and El Harib; and that two considerable towns, Tatta and Akka, stand on its banks.

From the southern declivity of Mount Atlas descend three other rivers, the Fileli, Ziz, and Ghir. We are not further acquainted with them than that they run southward, and are lost in the sands of the Sahara.

Climate.—The climate is not so hot as might be expected from the position of this country. A great part of the empire is subject to the alternation of the sea and land breezes, and those districts which lie beyond their reach are cooled to some extent by the winds which blow from the mountains. Frost and snow only occur on the mountains. Along the sea the thermometer never falls below 39° or 40°; and even in the hottest places, at S. Cruz and Tarudant, it generally does not rise above 84°, and rarely to 90°. The seasons are divided into the dry and wet. The wet season happens in our winter. Abundant rains fall towards the end of October, and last for about three weeks: these rains are followed by some dry weather, but they set in again about the middle of November, and showers are frequent till the month of March, when the dry season begins, which is rarely interrupted by showers. The rains are less general and frequent south of the river Seboo, and also less certain, which is probably the cause of the inferior fertility of these districts, as they are subject to frequent drought. Little is known of the climate south of Mount Bebauan, except that the heat is very great, and that the southern declivity of Mount Atlas has no rain, being exposed to the dry and hot winds that blow from the Sahara and disperse the few vapours which occasionally rise.

Productions.—Besides wheat and barley, which are extensively raised in most of the districts of the plains, rice, Indian corn, and holcus sorghum, or dhurra, are cultivated, especially the last-mentioned species of grain, which is very prolific, and constitutes the principal food of the lower classes. Other objects of cultivation are cotton, tobacco, sesamum, hemp, saffron, and different kinds of beans and peas. The plantations of olive-trees and almond-trees are very extensive. The fruit-trees of southern Europe are also common, especially the fig and the pomegranate. The date-tree is only cultivated on the southern declivity of Mount Atlas, and the best come from Draha and Tafilet.

In the districts south of the Oom-er-begh there are large plantations of henna (Lawsonia inermis).

The southern declivities of Mount Atlas are bare, but on the northern there are extensive forests, consisting of the olive, carob (Ceratonia siliqua), walnut, acacia, cedar, stunted palms, and rose-trees, and also cork-trees. The timber is fine, but not large.

Domestic animals of every kind are numerous. The horses are distinguished by their beauty, those of the native breed as well as those of Arab origin; the sheep, which are considered as indigenous, and are supposed to have spread from the declivities of the Atlas over all the world, produce a wool not inferior to any for softness, fineness, and whiteness; sheep and goats are more numerous than any other domestic animals. Goat-skins constitute one of the most important articles of export. Cows, asses, mules, and camels are also reared in considerable numbers. In the large uncultivated tracts wild animals abound, as lions, panthers, hyænas, wolves, and several species of antelopes and deer, as well as monkeys and wild boars. Wild boars are abundant in all parts, but most of the other ferocious animals are limited to the southern regions. Ostriches are found in the desert bordering on the southern and eastern districts, and their feathers constitute an article of export. Cranes and storks abound. The locusts sometimes lay waste the provinces bordering on the deserts. Bees are common, and wax is exported.

The mineral wealth of Marocco is very imperfectly known. Metals seem to occur in the greatest abundance on the southern declivity of Mount Atlas, especially in those parts which surround the plain of Sus-el-acsà, where gold and silver occur, but not in abundance; the latter occurs in the river Draha or Akassa (Assaca). Copper, which in Strabo's (p. 830, Casaub.) time was worked in these countries, is still abundant; the richest mine which is worked is near Teseleght, in Sus-al-acsà, but there are others in the neighbourhood of Tarudant. Lead is found in Mount Adrar and in the Lesser Atlas. Iron is worked in several places; and there is also antimony. Rock-salt is also said to be abundant, but is not worked. The several small lakes which lie along the sea-shore are natural salt-pans, which produce this useful article in abundance. Fullers'-earth, which is considered not inferior to the English, occurs in several places.

Inhabitants.—The population of this empire is differently estimated. Jackson thought that it amounted to fourteen millions, which number is reduced by Captain Washington to five or six millions. Graberg assigns to it 8,500,000 inhabitants, and states that the population is composed of the following nations, in this proportion:—

Amazirghis, namely,	
Berbers	2,300,000
Shellubs	1,450,000
Arabs, namely,	
Moors, Ludayas, and other mixed tribes	3,550,000
Beduins, and others of pure blood	740,000
Jews	339,500
Negroes, slaves and freemen from Soudan, Foulahs, Mandingoes, &c.	120,000
Europeans, Christians	300
Renegadoes	200
	8,500,000

The Amazirghis, or Mazirghis [BERBERS], are the most antient inhabitants of Northern Africa, and one of the most widely-spread nations of that continent, as is proved by the language, the different dialects of which are spoken by the tribes which extend from the banks of the Nile to the Atlantic, as the Tibboos and Tuaricks of the desert, the Fillelis in Segelmesa and Tafilet, and the different Shelluh tribes on the Atlas and Mount Bebauan. Most of the tribes occupying the southern districts of Tunis and Algiers also speak the same language. The Amazirghis in Marocco are divided into Berbers and Shelluhs. The Berbers occupy exclusively the mountain-region which extends along the Mediterranean, where they are called Riffins, from inhabiting the mountains of Er-Riff, and are divided into several tribes. Other tribes are spread over the mountains of the Lesser Atlas and the basin of the river Mulwia as far south as the source of that river. The Shelluhs occupy the Greater Atlas and its great branches Mount Bebauan and Mount Adrar. It is now the general opinion that their languages are only dialects of one language; but the tribes differ somewhat in their physical character and in their customs. The Berbers are nearly white, of middle size, well formed, and rather robust and athletic; their hair is frequently fair, resembling that of the northern people of Europe rather than any nation of Africa, and they have very little hair on their chins. They live generally under tents, or in caves situated on steep and nearly inaccessible mountains. They pay little regard to the orders of the sultan, and obey only their hereditary princes or chosen magistrates. In the plains they build houses of stone or wood, but always enclose them with walls. Their chief occupation is that of huntsmen and herdsmen, yet they cultivate some patches of ground and rear bees.

The Shelluhs are chiefly agriculturists, and exercise several trades; their houses are always built of stone, and covered with tiles or slates. They are less robust than the Berbers; their colour is sallow, and they resemble in some measure the Portuguese, from whom some authors think they are descended. They are much more advanced in civilization than the Berbers.

The Moors are the most numerous of the nations that inhabit Marocco. Their language, which is called Moghreb, or Occidental, is a dialect of the Arabic; but it is intermixed with many words from the language of the Amazirghis, and still more with Spanish words. The latter circumstance may be ascribed to the emigration of their ancestors from Spain after the conquest of Granada. These emigrants settled in the towns and plains along the Atlantic.

The Moors of Marocco are of middling size, and rather slender when young, but grow stout as they advance in years. Their colour varies between yellow and black, which is principally to be ascribed to their frequently marrying black women from Sudan. They are the only nation of Marocco with which the Europeans have an immediate intercourse, and they are the principal inhabitants of the towns; they fill the high offices of government, and form the military class. [MOORS.]

The Arabs are the descendants of those who emigrated at the time when the Mohammedan religion was diffused from the Hejaz, Yemen, and Hadramaut. A few families live in the towns, but the Beduins are dispersed over the plains, where they adhere to their wandering life, living in tents, and following the pastoral occupation. They are a hardy race, slightly made, and under the middle size. Their language is the Koreish, or Arabic of the Koran, which they pretend to speak in its purity.

The Jews are intermixed among all these nations: their condition is best among the Berbers, where they follow different trades; but among the Shelluhs and Moors they are much oppressed, and exposed to the most ignominious treatment. They are very numerous in the seaports and commercial towns

The negroes, who are imported as slaves, frequently obtain their liberty; and as they are distinguished by fidelity, the emperor has thought it expedient to form his body-guard of them, which is the only standing army of the empire, and at present not above 5000 strong.

Manufactures.—As the inhabitants dress chiefly in wool, the manufacture of woollen cloth is general, but the material is usually coarse. In some places however there are manufactories on a large scale, which supply articles of export. In the town of Fez the red caps are made which are used in all the countries that border on the Mediterranean, besides several kinds of silk goods, especially scarfs, which are used like girdles, and sometimes are interwoven with gold thread. The best kinds of silk stuffs, called *Culauan*, are made of silk imported from Syria; the more common material is got from the Beduins, whose wives ra silkworms. The inhabitants of Fez are also distinguished as goldsmiths, jewellers, and cutters of precious stones; many of them are also occupied in making marocco leather and different kinds of earthenware.

Tanning is well understood. Very good leather is made in the neighbourhood of the towns of El Kasar and Mekinez. The tanyards in the capital are very extensive, and the leather which they produce is superior to any made in Europe. The tanners possess the art of tanning the skins of lions and panthers, and giving them a snow-white colour, with the softness of silk. The marocco leather of the capital is yellow, that made in Tafilet green, and in Fez it is dyed red. Their bright colours are considered inimitable in Europe. Very good sole-leather is made in Rabatt and Tetuan.

Carpets are chiefly made in the province of Ducalla, south of the river Oom-er-begh, and are known in Europe by the name of Turkey carpets. They are much esteemed for their colours and the great variety of the pattern: the better kinds are very dear.

Political Division and Towns.—The empire of Marocco is composed of the two kingdoms of Fez and Marocco, of which the former occupies the countries north of the river Oom-er-begh and the basin of the river Mulwia; the kingdom of Marocco comprehends the remainder, with the exception of the countries south of the Greater Atlas and Mount Bebauan, which are considered as a separate kingdom, called that of Tafilet. At present the whole country is divided into thirty governments, of which fifteen belong to Fez and fifteen to Marocco. In the latter the country between Mount Bebauan and Mount Adrar is included. The countries of Draha, Tafilet, and Segelmesa are divided into two other governments.

Along the coast of the Mediterranean the Spaniards possess Melilla, near Ras-ul-dir, or Cape Tres Forcas, and farther westward Alhucemas and Peñon de Velez, three small fortresses, which have no communication with the interior.

Not far from the Straits of Gibraltar is Tetuan, built on the declivity of a hill, about half a mile from a small river (Martil) which falls into the Mediterranean about five miles from the town: the mouth of the river forms a harbour for vessels of middling size. It carries on a considerable commerce with Spain, France, and Italy, exporting wool, barley, wax, leather, hides, cattle, mules, and fruits, of which the valley of Tetuan produces abundance of the finest quality. The streets are narrow and unpaved. The population is 18,000 (Graberg), or 40,000 (Semple).

Near the eastern entrance of the Straits of Gibraltar is the Spanish town of Ceuta [CEUTA], and near the western the town of Tangier, where the European consuls-general reside. Tangier is built on a hill, near a spacious bay, 14 miles west of Cape Spartel, and its harbour is defended by three small fortresses. The streets are wider and straighter than in other towns of the empire; but except the houses of the European consuls, and a few belonging to rich persons, they are all small and inconvenient. The Jews have here several synagogues, and the Roman Catholics have a church, the only Christian establishment of this kind in the empire. The commerce of this place is limited to some trade with Gibraltar and the opposite coast of Spain. The population is 9500 (Graberg), or 8000 (Washington).

Along the Atlantic, from north to south, are the following towns: El Araish, or Larash, at the mouth of the river El Kos, containing 4000 inhabitants (Graberg and Washington), has a good harbour; the bar at the mouth of the river has 16 feet of water at spring-tides, and spacious anchoring-ground within, with water enough for frigates. Sla, or Salé, and Rabatt, are separated from each other by the river Bu Regreb, which forms their common harbour; they contain together 50,000 (Graberg) or 31,000 inhabitants (Washington). Salé, formerly noted for the boldness of its pirates, is badly built and partly in ruins; but Rabatt is a thriving town, and has some good streets. Its commerce is still considerable, though a portion of it has been transferred to Mogadore, and its trade with Genoa and Marseille is extensive. The principal articles of exportation are wool, corn, and wax, and the manufactured goods of Fez and Mekinez. The European and East India goods, destined for Fez and the northern provinces, are imported through this town. Saffi, or Asafi, farther south, not far from Cape Cantin, is between two hills in a valley, and is subject to inundations. It formerly exported many products of the country, as its roadstead affords excellent anchorage; but since the rise of Mogadore it has been on the decline. The population is 12,000, including 3000 Jews.

Mogadore, or Suera, as the Moghrebins call it, the port of the town of Marocco, lies on the sea-shore between Cape Cantin and Cape Gher. It was founded in 1760. Mogadore is built on a low shore, consisting of moving sand, which extends from 5 to 15 miles inland, where a fertile country begins. It is regularly built, the streets being straight, but somewhat narrow. The Europeans settled here have erected several large buildings in the African style. The town is divided into two parts, one of which is called the Fortress, and contains the custom-house, the palace of the Pasha, the other public buildings, and the houses of Europeans; the other part is only inhabited by Jews. The harbour is formed by a small island, lying south west of the town and about two miles in circumference. At low tides there are only 10 or 12 feet of water in the harbour, and large vessels are obliged to anchor without, at a distance of about two miles. The commerce of this place with London, Amsterdam, Cadiz, Leghorn, Genoa, the Canary Islands, Hamburg, and the United States of America, is considerable. The population is 10,000 (Jackson), or 17,000 (Graberg).

Agadir, or S. Cruz, farther south, has a good harbour, and formerly carried on a considerable trade, which however was transferred to Mogadore by order of the government.

In the interior there are several populous towns, of which the following are the principal: Teza, or Taza, on one of the upper branches of the Seboo river, in a very fertile country, has 10,000 or 12,000 inhabitants (Graberg), some manufactures, and a considerable trade with Tlemsan in Algiers (being situated near one of the most frequented passes of the Lesser Atlas), and with Fez. Al Kassar, or Ksar, on the El Kos river, is well built, and has some manufactures, with 8000 (Washington) or 5000 (Graberg) inhabitants.

Fez, or Fas, the most industrious and commercial town of the empire, is situated in a valley which is drained by one of the upper branches of the Seboo river. It contains upwards of 100 mosques and seven public schools with numerous pupils. The mosque called El Karubin is a magnificent building, and that of Mula Driss, the founder of the town (807), is the object of many pilgrimages and an asylum for thieves and murderers. The imperial palace, with the buildings and gardens annexed to it, occupies a great space. The number of persons employed in manufactures is considerable. Every trade is carried on in a separate street; generally only one kind of goods is sold in each shop. The commerce of this town with the seaports, especially Rabatt, and by means of the caravans with Tunis, Kahira, and Sudan, is very great. The streets are narrow, and, owing to the great height of the houses, also dark: there are numerous extensive caravansaries, or public inns, where the travelling merchants find lodging. The population is 88,000 (Graberg), or 20,000 (Caillié).

Mekinez, or Miknas, west of Fez, a large town built on a hill in a wide and fertile plain, has also narrow crooked streets. It has many manufactures, especially of leather. The imperial palace is more than two miles in circuit, and has large orchards and gardens annexed to it. The population is 56,000 (Graberg).

Tefza is situated in one of those fine valleys which are watered by the numerous branches of the Oom-er-begh, not far from the base of the Atlas. It has large manufactures of woollen cloths, which are exported to Italy and elsewhere. The population is 10,500 (Graberg).

Demnet, or Dimnit, a considerable place east of the town of Marocco, near the base of a branch of Mount Atlas, carries on a considerable trade. The caravans which go from Marocco to Draha and Sudan here begin to ascend the mountain-pass which leads to Tatta.

Marocco, the capital of the empire and the residence of the sultan, is situated on level ground, four miles south of the river Tensift, and is surrounded by a strong wall thirty feet high, with square turrets at every fifty paces. The walls are near six miles in circuit, but the area enclosed is far from being covered with buildings, there being several large gardens and open spaces. The streets are narrow and irregular, and in many cases, as in Fez and Mekinez, connected by arches and gates. Several open places, which cannot be called squares, are used as market-places. The houses, which are only of one story, have flat roofs and terraces, like those of Spain, and the rooms open into a court, which is sometimes surrounded by arcades and embellished by a fountain. The houses have no windows, no fire-place, and no furniture, except a cushion or two. Large aqueducts, which convey the water of the river Tensift to the city, surround it, and some of them are ten or twelve feet deep. They are continued southward towards the Atlas, in some place to a distance of 20 miles. These aqueducts supply the fountains with water: the fountains are numerous, and some of them have traces of delicate sculpture. On the south of the town, but without the walls, is the imperial palace: a wall of a quadrangular form, enclosing a space about 1500 yards long by 600 wide, is equal in strength and height to the walls of the town. The enclosed space is divided into squares, laid out in gardens, round which are detached pavilions, forming the imperial residences. The floors of the rooms are tessellated with various coloured tiles, but otherwise they are plain, the furniture consisting of a mat, a small carpet at one end, and some cushions. There are nineteen mosques, two colleges or medrasses, and one hospital in this town. The principal mosque, El Koutubía, is distinguished by a lofty tower, 220 feet high, a master-piece of Arabic architecture. The bazaar, or kaisseria, is a long range of shops, covered in and divided into compartments, in which the productions of the agricultural and manufacturing industry of the country, as well as goods from China, India, and England, are exposed for sale. There are some manufactures; the tanneries of Marocco have been already mentioned. Capt. Washington states that the population cannot exceed 100,000, and is perhaps not above 80,000, including 5000 Jews; Graberg assigns it only 50,000 inhabitants. Plague and famine have reduced a population which was formerly much greater.

In the province of Sus-el-acsà is Tarudant, once the capital of a separate kingdom, about 60 miles from the seaport of Agadir or S. Cruz. It is built in the middle of an extensive plain, and its walls, which are now in a ruinous state, are very extensive. The houses are low and built of earth, and each of them is surrounded by a garden and wall, so that the place rather resembles a well peopled country, than a town. The inhabitants are industrious, and the woollen dresses and marocco leather made here are much esteemed; copper and saltpetre are abundant in the neighbourhood, and a considerable quantity of the copper is made into domestic utensils in this town. The population is 22,000 (Graberg).

In this province are also the towns of Tedsi, with 15,000 industrious inhabitants (Graberg), and Tagavost, which is said to be more populous. Farther to the south-west, near the banks of the river Draha, is the village of Nun, 50 miles from the sea, with 2000 inhabitants. It is one of the points from which the caravans depart for Sudan.

On the southern declivity of Mount Atlas are Tafilet and Tatta, two other places from which the caravans start on their route to Sudan. The former is said to be a considerable place, with 10,000 inhabitants (Graberg), but Caillié in traversing this country neither saw nor heard of any town of this name.

Education.—The Moors send their children to school at the age of six years. The elementary schools, which are very numerous, both in the towns and in the country, are either private or public establishments. The former are called *mesid*, or *mektib*, and the latter *jamd*. In these schools reading, writing, and correct pronunciation are taught; the children also learn by heart some passages of the Koran. The method of teaching resembles in some respect that of Bell and Lancaster, which seems to have been used in the East from a very early time. In a few schools, established for girls, they teach reading and writing, and some things which are connected with domestic economy. Boys sometimes remain in these schools, until they know the whole of the Koran by heart, when they pass for their further education into the higher schools, called in the singular *mudersa*, and in the plural *mudaris*, where they are prepared for the university of Fez, called Dar-el-i'lm (or the House of Science), or other colleges. In the colleges they are instructed in grammar, theology, logic, rhetoric, poetry, arithmetic, geometry, astrology, and medicine. The commentaries and traditions relating to the Koran, the laws, legal procedure, and all the formalities to be observed in the courts, are also explained. There are three degrees; students called *taleb*, doctors called *f'kih*, and wise men *a'lem*, in the plural *o'lama*. As there are no printing establishments, calligraphy, called *gedvel*, is enumerated among the sciences.

Commerce.—The Moghrebins carry on a very active commerce with Sudan or the interior of Africa, and with Egypt and Arabia by caravans, and with several parts of Europe by sea. The caravans, when they set out from the commercial towns of Tetuan, Fez, Marocco, and Tafilet, generally consist of about 150 persons and 1000 or 1500 camels, and are then called *cafilas*; but when they have united at Tatta or Akka, on the Draha river, the point where they enter the desert, they consist of about 500 or 600 persons, with 16,000 and even 20,000 camels. Towards the southern border of the desert they come to the oases of Touadenni and El A'rauan, where there are immense deposits of rock-salt, of which they buy large quantities for the market of Sudan. From Timbuctoo, as a central point, the merchants traverse the adjacent countries, exchanging their goods for those of Sudan. They import into these countries rock-salt, woollen cloth and dresses, scarfs, tobacco, Turkish daggers, and blue cloth, and take in return ivory, rhinoceros' horns, incense, gold in bars and powder, ostrich feathers, gum-arabic, cotton, assafœtida, indigo, and slaves. Graberg estimates the annual value of the exported goods at one million of Spanish dollars, and that of the returns at ten times that sum; two-thirds of the imports are again exported to Algiers and Tunis.

The caravans which go to Mecca are chiefly composed of pilgrims, and are much more numerous. They depart only once in the year, and follow two routes. The northern leads from Fez through Teza over the Lesser Atlas, traversing the northern districts of Algiers and Tripoli, in which latter country it may be said to terminate at Kairoan. Hence it passes southward through Gadamis and Fezzan to Alexandria and Kahira, and ultimately to Mecca. The southern road passes from Marocco to Tefza, and thence through the southern districts of Algiers and Tunis to Gadamis and Fezzan, whence it leads to Alexandria and Mecca. Indigo, cochineal, ostrich-feathers, skins, and leather, with the woollen articles manufactured in Fez, Tefza, and Tafilet, are exported by these caravans, and they import the cotton and silk goods of India, some Persian silk-stuffs, rose-oil, amber, musk, balsam, and spices, but particularly cotton, wool, and raw silk. The raw silk is chiefly purchased at Kahira, and Graberg thinks that the annual transactions of the caravans in that town amount to two millions of Spanish dollars.

European vessels visit the harbours of Tetuan, Rabatt, Saffi, and Mogadore, and export the produce of the empire to Italy, France, Spain, England, and Holland. The principal goods exported are:—wool of good quality, which goes principally to Genoa, Marseille, and Holland; wax, to Leghorn, Marseille, Cadiz, Lisbon, and London; hides of cattle and camels, to Leghorn, Marseille, and London; gum-arabic, which is inferior to that brought from the Senegal, mostly to London and Holland; copper, to Holland; bitter and some sweet almonds, from Mogadore to Holland; goatskins, especially those brought from Tafilet, to England; oil, made of the fruits of the elæodendron argan, or argan-oil (Graberg), and also olive-oil; archil; ivory, especially to Holland; ostrich-feathers, white and grey, to England; dates, to England and Lisbon; and corn, to all places where its exportation is permitted. Among the less important articles are some manufactured in the empire, as scarfs of wool and silk, red or yellow marocco leather slippers and shoes, the black cloaks of Tarudant, and the shawls of Fez and Tefza.

Among the goods which are imported, the cotton-cloths brought from the East Indies and from England constitute by far the most important articles. There are also imported different kinds of woollen stuffs; raw silk and silk stuffs; colonial merchandise, especially sugar, pepper, and ginger; very little coffee is used, but much tea; opium, arsenic, mastich, cochineal, alum, bar-iron from England; steel from England and Trieste; iron-wire, tin and nails, corals, looking-glasses, knives, cotton, brimstone, earthenware, and glass. In 1831 the number of vessels which entered the seaports was sixty-four, and the tonnage 3870 tons. In the same year ninety-four vessels left the ports, with a tonnage of 5849 tons. The imports were valued at 172,000*l.*, and the exports at somewhat more than 131,000*l.*

Government.—The goverment is absolutely despotic, ever more so than in the Turkish empire; the people are much oppressed, and the Christian merchants exposed to great losses by capricious ordinances.

(Graberg of Hemsö, *Specchio Geografico e Statistico dell' Impero di Marocco;* Jackson's *History of Marocco* and *Shabeeny;* Washington, in the *London Geographical Journal;* Lempriere's *Tour from Gibraltar to Tangier,* &c.; Caillié's *Travels through Central Africa,* &c.; and Semple's *Second Tour in Spain,* &c.)

MARONITES, the name of a community of Christians belonging to the Western or Roman church, and living on Mount Lebanon. They are neighbours of, and allied to, and in some places mixed with the Druses, and, like them, independent, in great measure, of the Turkish power. The Maronites occupy the valleys and fastnesses of the principal ridge of Lebanon east of Beyroot and Tripoli, and they extend inland as far as the Bekaa, or plain between the Libanus and Anti-Libanus, where they are mixed with the Druses, though they do not intermarry with them. The town of Zhaklé, in the valley of Bekaa, contains between ten and twelve thousand inhabitants, chiefly Maronites. There are also many Maronites at Beyroot and Tripoli; but the tract of country in which the great bulk of the Maronites reside is called Kesrouan. It extends along the ridge of Libanus from the Nahr el Kelb, a stream which enters the sea 12 miles north of Beyroot, to the Nahr el Kebir, which enters the sea north of Tripoli, near the island of Ruad, the antient Aradus, on which side the Maronites border on the Nosaïris, or Ansarieh, who extend to the northward towards Latakieh, and the Ismaelians, who live farther inland near the banks of the Orontes. [Ismaelites.] To the eastward the Maronites have for neighbours the Metualis, a tribe of independent Moslems, of the sect of Ali, who live under their own emir, and occupy the belad or district of Baalbek and part of the Anti-Libanus; and on the south they border on the territory of the Druses, with whom they form one political body, being subject to the Emir Beschir [Druses], in so far as they join him when he calls them to arms for the common defence, and pay him their share of the tribute, which the emir paid formerly to the Porte, and now pays to the pasha of Egypt. But in their internal concerns the Maronites are governed by their own sheiks, of whom there is one in every village, from whose decision there is an appeal to the bishops, who have great authority; and in some cases to the emir of the Druses, and his divan, or council. The clergy are very numerous; the secular parish clergy are married, as in the Greek church; but the regular clergy, who are said to amount to 20,000, and are distributed among about 200 convents, follow the rule of St. Anthony, and are bound by vows of chastity and obedience. The Maronite monks are not idle; they cultivate the land belonging to their convents, and live by its produce. Every convent is a farm The convents are under the jurisdiction of bishops, of whom there is one in every large village. The bishops are under the obligation of celibacy. The bishops collectively elect the patriarch, who is confirmed by the pope, and who resides at the convent of Kanobin, in a valley of the Libanus, south-east of Tripoli, where there is a printing-press, which furnishes the elementary books for the use of the Maronite schools. Not far from Kanobin is the large village of Eden, ten miles above which, and high up the Libanus, is the famed clump of old cedars, called the 'Cedars of Solomon,' of large dimensions, but now reduced to seven in number (Lamartine, *Voyage en Orient;* Richardson), not including the younger and smaller ones. Dr. Richardson measured the trunk of one of the old trees, and found it 32 feet in circumference. The whole clump of old and young trees may be walked round in about half an hour. Old cedars are not found in any other part of Libanus.

At the opposite or southern extremity of the Kesrouan is the handsome convent of Antoura, which is the residence of the papal legate and of some European missionaries. Near it is a convent of Maronite nuns.

The Maronites derive their name from a monk of the name of Maro, who, in the fifth century, collected a number of followers, and founded several convents in these mountains. When the Monothelite heresy prevailed in the East in the seventh century, and was favoured by the court of Constantinople, many Christians who did not embrace its tenets took refuge in the fastnesses of Libanus, around the convents, and thus the name of Maronites was assumed by the population of the mountains. This is the account of *the* Maronites themselves: others pretend that the Maronites were Monothelites, who took refuge in the Libanus after the emperor Anastasius II. had condemned and proscribed their sect, in the beginning of the eighth century. [Eutychians.] Joseph Simonius Assemani, and his friend Ambarach, better known as Father Benedetti, have defended the Maronites from the charge of Monothelitism. Ambarach translated from the Arabic into Latin the work of Stephen, patriarch of Antioch, concerning the origin and the liturgy of the Maronites. In 1736, at a great synod held at Marhanna, the Maronite church formally acknowledged the canons of the Council of Trent, but they retained the mass in the Syriac language and the marriage of priests. Before that time they received the sacrament under both forms, as in the Greek church. At mass the priest turns towards the congregation and reads the gospel of the day in Arabic, which is the vulgar tongue.

The Maronite population is said to be above 200,000 individuals, and to contain between thirty and forty thousand men fit for military service. Every Maronite is armed, and they are all soldiers in case of need. Volney reckoned them, in 1784, at 120,000, but the population has been rapidly increasing since that time. Their language is Arabic, and by their appearance and habits they belong to the Arabian race. They are a fine-looking people, high-spirited, civil and hospitable, especially towards European travellers, and perfectly honest. Robbery and other acts of violence are hardly known among them. They are altogether an interesting race, full of vigour, and perhaps destined with the Druses to act an important part in the future vicissitudes of Syria. (Jowett, Light, Lamartine, and other travellers in Syria.)

There is at Rome, on the Quirinal Mount, a convent of Maronite monks, who perform the service of the mass in the Syriac language, according to the liturgy of their country. This church was founded by Pope Gregory XIII., and is dedicated to St. John. The monastery serves as a college for young Maronites who come to Rome to study and take orders, after which they return to their own country. It is one of those exotic colonies which give a peculiar interest to the city of Rome.

The ceremonies of these Maronites of Rome on great festivals, their chanting in Syriac, and their curious musical instruments, are described by the Abbé Richard, in his 'Voyage en Italie.'

MAROONS. [Jamaica.]

MARO'T, CLE'MENT, born at Cahors in 1495, entered the service of the duchess of Alençon as page. He afterwards followed Francis I. to Italy, and was wounded and taken prisoner at the battle of Pavia. On his return to France he wrote poetry for Diana of Poitiers, the king's mistress, who showed him favour; but having presumed too much upon his familiarity with her, she discarded him, and he was soon after put in prison, through her agency as some have believed, in 1525. During his imprisonment he wrote his 'Enfer,' a satire against the lawyers, and he revised his 'Roman de la Rose.' When Francis I. returned from his Spanish captivity, Marot was released, and re-appeared at court. Margaret, queen of Navarre, was much pleased with him; but as usual his vanity made him too presumptuous, and he fell into disgrace. He then turned Calvinist, and went to Geneva; but soon finding himself in an atmosphere little suited to him, he returned to Lyon, abjured Calvinism, and served again under Francis I. in the Italian campaign of 1535. Some years afterwards he published a French version of part of the Psalms, which was read with pleasure, but the Sorbonne condemned it, and Marot took refuge at Turin, where he died in poverty in 1544. He wrote epistles in verse, elegies, satires, ballads, rondeaux, and epigrams. His style has the simplicity of his age, united with grace and poetical fancy. He left a natural son, Michel Marot, who was also a poet. The works of both father and son were published together at Lyon in 4 vols. 4to., 1731.

MARPURG. [Marburg.]

MARPURG, FRIEDRICH WILHELM, a very eminent writer on the theory of music, was born in 1718, at Sechausen in Prussia. According to M. Fayolle he was a counsellor of war to Frederick II. of Prussia, but his friend Gerber says that he was secretary to one of that king's ministers; both however agree that he latterly held the office of director of the lotteries at Berlin. Little more is known of his personal history than that early in life he passed a considerable time in Paris—which probably led to his adop tion of the theory of Rameau, though he was by no means a slave to it—that his learning was considerable, his industry indefatigable, his morals exemplary, and his manners engaging. In 1793 M. Gerber spent some weeks with him at Berlin; he then possessed all the vivacity of youth, and his conversation was witty and agreeable. Shortly after this he began to show symptoms of mental as well as bodily decay, and died early in 1795.

Marpurg is one of the most estimable didactic writers on the subject of music that Germany has produced. To a profound knowledge of its principles (says his French biographer) he joined a correct judgment and a refined taste. 'He was, perhaps,' Dr. Burney remarks, 'the first German theorist who could patiently be read by persons of taste, so addicted were former writers to prolixity and pedantry.' Among his works are two which claim particular notice, his 'Manual of Harmony and Composition' (*Handbuch bey dem General-bass*, &c.), and his 'Traité de la Fugue et du Contrepoint.' The first is exceedingly methodical and clear, and may be considered as a musical Euclid. The second would be the best and most complete treatise on fugue and canon that has ever appeared, were it not lamentably deficient in method and arrangement, and also too much devoted to instrumental music, to the exclusion of that of the vocal kind. But in a new edition of this, M. Choron has remedied much of the evil of which there was such ample reason to complain.

Marpurg was author also of many other works, all of them possessing more or less merit, a full and descriptive list of which is given in Gerber's 'Lexicon,' and in the French Dictionary which has supplied part of the foregoing notice.

MARQUE, LETTRES DE. [PRIVATEERING.]

MARQUESAS ISLANDS were so called in honour of the Marquis Mendoça de Canete, by Mendaña de Neyra, who discovered them in 1595; others call them the Mandaña Archipelago. They are situated in the Pacific, and extend about 200 miles in a north-west and south-east direction, between 10° 30′ and 7° 50′ S. lat., and 139° and 141° W. long. A wide channel divides them into two groups, of which the south-eastern contains five and the north-western eight islands. The latter, having been discovered by the Americans in 1797, are also called Washington's Islands.

The largest islands of the southern group are Santa Dominica, or Hiwaoa, Santa Christina, or Tahuata, and Hood's Island, or Tiboa. They are about 10 miles long from south-south-west to north-north-east. The principal islands of the northern group are, Noukahivah, or Nouhivah, Uahuga, and Uapoa, or Roapoa. Noukahivah, the largest, is nearly 20 miles long from south-east to north-west, and 70 miles in circumference.

An elevated ridge of rocky mountains traverses each island lengthways, and in the larger one rises to an elevation of 2000 or 3000 feet. The mountains have on both sides high offsets, which extend to the shores of the sea, and thus divide the low land along the shores into valleys, which have no communication with one another except across the highlands that separate them. The mountains in the interior are mostly bare, rugged, and inaccessible. The coast is rocky, abrupt, and beaten by a surf; no coral reef encircles or protects the islands, though the detritus of coral is abundant on the beach. Noukahivah is of volcanic origin, which may be the case with the rest also. The soil is rich; in the valleys it is clay, mixed with vegetable mould, but on the lower declivities of the hills it is thin, and covered by coarse grass in tufts. There are numerous harbours, and many of them very safe, as Resolution Bay, on Tahuata; and the three harbours, Anna Maria, or Tayo-Hoae, Cho-ome, or Comptroller's Bay, and Hapoa, or Tshitshagoff, on Noukahivah.

The climate is rather warm. The thermometer seldom descends below 64° or 68°. In May it ranges between 72° and 77°, and in June about 80°. Winter is characterised by abundant showers of rain. Sometimes however not a drop of rain falls for nine or ten months, the consequence of which is famine. The prevailing wind is the eastern trade-wind, which blows strongest in autumn. The south-west wind prevails in winter, and the north wind is frequent in summer. West and north-west winds are nearly unknown. Thunder-storms are of rare occurrence. The climate is very healthy, and diseases are rare. The fruit-trees are chiefly the cocoa-nut, bread-fruit, and papaw (*Carica papaya*). The inhabitants also cultivate bananas, plantains, sweet-potatoes, and taro (*Caladium sagittifolium*). From the bark of the mulberry-tree (*Morus papyrifera*) they make their garments. The wild cotton is superior to that which is cultivated in some other islands, and the sugar-cane is abundant, large in growth, and of excellent quality. Tobacco is extensively cultivated. There are no animals except hogs and rats. Fish is abundant, and constitutes one of the most common articles of food.

The inhabitants belong to the same race that peopled the Society and Sandwich Islands, of which their language and bodily conformation offer undoubted proof. Their complexion is of a dark copper, but the women are much lighter than the men. Many of the navigators speak of their figure in terms of admiration, and consider them as perfect models of symmetry. Langsdorf states that the measures taken on the body of one of their chiefs agreed exactly with those of the Apollo Belvedere. Later travellers do not confirm such statements, and it seems that the difference between individuals is greater here than in most other countries, and that the men vary in height between four feet ten inches and six feet. They have carried the art of tatooing the body to a greater degree of perfection than any nation, the bodies of distinguished persons being covered all over with regular figures of a very tasteful pattern. The people are cannibals. They eat both the bodies of their enemies, who are killed in battle, and also other persons, at the instigation of their priests, or rather sorcerers. In time of famine, which occasionally happens, women and children are killed for food. They have chiefs, but they are without authority. Their sorcerers have acquired a great influence over them, as they believe in spirits, who punish those who transgress what has been determined by the sorcerers. They have always shown themselves very friendly towards Europeans, but the missionaries who have been among them have not been successful in their labours.

(Cook's *Second Voyage;* Krusenstern's *Voyage;* Langsdorf's *Voyages and Travels in various Parts of the World;* Waldegrave and Bennett, in *London Geogr. Journal*, vols. iii. and vii.)

MARQUIS, a title of honour used in England and on the Continent. Persons who have this title in England are the second in the five orders of English nobility. The dukes only are above them. In parliament all peers have the same privileges, by whatever title they are known. Marquises in England have this privilege above earls, that their younger sons are addressed as 'my lord,' as Lord Henry Petty, Lord John Thynne.

All titles of honour seem to have been originally the names of important offices, or to have denoted persons invested with a peculiar political character. Marquis is generally supposed, as we think justly, though other origins have been suggested, to have designated originally persons who had the care of the marches of a country. [MARCHES.] In Germany the corresponding term is *markgraf* (margrave), which seems to be 'lord of the marches.'

There were no English marquises before the reign of Richard II. In the reign of Edward III. a foreign marquis, the marquis of Juliers, was made an English peer with the title of earl of Cambridge, and this circumstance probably suggested to King Richard the introduction of this new order of nobility. The person on whom it was conferred was his great favourite Robert de Vere, earl of Oxford, who was created duke of Ireland and marquis of Dublin in 1385. But the title had no long continuance in him, for three years after he was attainted and his honours forfeited.

In 1397 one of the illegitimate sons of John of Gaunt was created marquis of Dorset, but he was soon deprived of the title, and his son had only the earldom of Somerset. The title of marquis of Dorset was however revived in the same family in 1443, when also William de la Pole was made marquis of Suffolk.

In 1470 John Nevil, earl of Northumberland, brother to Richard Nevil, earl of Warwick, the king-maker, was made marquis Montacute, but he was soon after slain at the battle of Barnet, and the title became lost.

In 1475 Thomas Grey, earl of Huntingdon, son to the queen of King Edward IV. by her former husband, was made marquis of Dorset; and in 1489 Maurice Berkeley, earl of Nottingham, was made marquis of Berkeley. Henry VIII. made Henry Courtenay, earl of Devonshire, marquis of Exeter; and he made Anne Boleyn, a little before his marriage with her, marchioness of Pembroke. Willia

Parr, earl of Essex, brother of Queen Catherine Parr, was created marquis of Northampton by King Edward VI.; and William Powlett, earl of Wiltshire, marquis of Winchester.

All these titles had become extinct in 1571, except that of marquis of Winchester. This title still continues in the male representative of the original grantee, though for a century or more it was little heard of, being lost in the superior title of duke of Bolton.

Queen Elizabeth made no new marquis, nor did King James I. till the fifteenth year of his reign, when his great favourite George Villiers was created marquis of Buckingham. Charles I. advanced the earls of Hertford, Worcester, and Newcastle to be marquises of those places; and Henry Pierrepoint, earl of Kingston, was made marquis of Dorchester.

Charles II. advanced the earl of Halifax to be marquis of Halifax in 1682, and James II. made the earl of Powis marquis of Powis in 1687.

A new practice in relation to this title was introduced at the Revolution. This was the granting of the title of marquis as a second title when a dukedom was conferred. Thus when Schomberg was made duke of Schomberg he was made also marquis of Harwich; when the earl of Shrewsbury was made duke of Shrewsbury he was also made marquis of Alton: and when the earl of Bedford was made duke of Bedford he was also made marquis of Tavistock. There were many other creations of this kind in the reign of William III., and several of marquisates only. It is not intended to name all the instances, either in this or the subsequent reigns. Of the existing dukes eleven have marquisates in the second title, which is borne by the eldest son during the life of the father.

The only marquis who sits in the House of Peers as a marquis, and whose title dates before the reign of George III., is the marquis of Winchester. The other marquises are all of recent creation, though most of them are old peers under inferior titles.

The title seems not to have been known in Scotland till 1599, when marquises of Huntley and Hamilton were created.

MARRIAGE is a contract by which a man and a woman enter into a mutual engagement, in the form prescribed by the laws of the country in which they reside, to live together as husband and wife during the remainder of their lives.

Marriage is treated as a civil contract even by those Christians who regard it as a sacrament, and as typical of the union between Christ and the church. The religious character of the transaction does not attach until there has been a complete civil contract, binding according to the laws of the country in which the marriage is contracted. The authority of the sovereign power in regulating and prohibiting marriages is therefore not affected by the superinduced religious character.

Among Protestants marriage has ceased to be regarded as a sacrament, yet in most Protestant countries the entrance into the marriage state has continued to be accompanied with religious observances. These are not however essential to the constitution of a valid marriage, any further than the sovereign power may have chosen to annex them to, and incorporate them with, the civil contract.

After the establishment of Christianity, in order to avoid the scandal of persons living together who were not known to be married, and also to secure and perpetuate the evidence of marriage, where really contracted, it became usual to make the marriage promise in the presence of the assembled people, and to obtain at the same time the blessing of the priest upon their union, except when one of the parties had been married before, in which case no nuptial benediction was antiently pronounced, the benediction once received by one party being considered sufficient to hallow the union as to both, unless by the distinction it was intended to intimate that second marriages, though tolerated, were not sanctioned by the church. So late however as the twelfth century, in a decretal epistle of Alexander III. to the bishop of Norwich, the pope says, 'We understand from your letter that a man and woman mutually accepted one another without the presence of any priest, and without the observance of those solemnities which the Anglican church is wont to observe, and that before consummation of this marriage he had contracted marriage with another woman, and consummated that marriage. We think right to answer, that if the man and the first woman accepted one another de præsenti, saying one to another, "I accept thee as mine, and I accept thee as mine," although the wonted solemnities were not observed, and although the first marriage was not consummated, yet the woman ought to be restored to her husband; since after such consent he neither should nor could marry another.'

Private marriages, designated *clandestine* marriages by the clergy, continued to be valid till the Council of Trent, which, after anathematizing those who should say that private marriages theretofore contracted by the sole consent of the parties were void, decreed, contrary to the opinion of 56 prelates, that thenceforward all marriages not contracted in the presence of a priest and two or three witnesses should be void. This decree, being considered as a usurpation upon the rights of the sovereign power, which alone can prescribe whether any and what formalities shall be required to be added to the consent of the parties in order to constitute a valid marriage, has never been received in France and some other Catholic countries.

A marriage was clandestine if contracted otherwise than in public, that is, in facie ecclesiæ; and it was called an *irregular* marriage if it was clandestine, or if, though not clandestine, it was contracted without the benediction of a priest in the form prescribed by the rubric, the intervention of a priest having latterly been required in all cases, even though one of the parties were a widower or a widow. Clandestinity and irregularity subjected the parties to ecclesiastical censures, but did not affect the validity of the marriage.

The decrees of the council of Trent had no force in England. A marriage by mere consent of parties, until the passing of the Marriage Act in 1753, constituted a binding engagement; though if application were made to the ecclesiastical courts for letters of administration, &c., under a title derived through such irregular marriage, those courts sometimes showed their resentment of the irregularity by refusing their assistance, more especially where the non-compliance with the usual formalities could be traced to disaffection to the Established Church. What the formalities required by the Church before the Marriage Acts were, it is now immaterial to consider. Such of them as are not incorporated into any of the Marriage Acts, are now of no force for any purpose.

To constitute a valid marriage, as well before as since the Marriage Acts, it is necessary, 1st, that there should be two persons capable of standing in the relation of husband and wife to each other; 2ndly, that they should be willing to stand in that relation; and 3rdly, that they should have contracted with one another to stand in that relation.

1. The capacity of standing in the relation of husband and wife implies that at the time of the contract there should be no natural or legal disability. Total and permanent disability on either side to consummate marriage will render the contract void. Temporary disability from disease does not affect the validity of a marriage. Temporary disability from defect of age does not invalidate the marriage, but it leaves the party or parties at liberty to avoid or to confirm such premature union on attaining the age of consent, which for males is 14, and for females 12. Before the abolition of feudal tenures, when the lords were entitled to sell the marriages of their male and female wards, infantine marriages were very common, fathers being anxious to prevent wives and husbands from being forced upon their children after their death, and lords being eager, either to secure the prize for their own family, or to realise the profit resulting from a sale. A person who is already married is under a legal disability to contract a second marriage whilst the first wife or husband is alive; and although there may have been the strongest grounds for believing that the first wife or husband was dead, the children of the second marriage would not in England derive any benefit from the absence of moral guilt in their parents, though in France and some other countries the issue of marriages so contracted, bonâ fide, are treated with greater indulgence.

Near consanguinity or relationship in blood is a legal impediment to marriage. The degree of nearness which shall disable parties from uniting in marriage varies in different countries, and has varied at different periods in our own.

This impediment is founded not only upon the moral but upon the physical constitution of man. The purity of domestic intercourse, the sanctity of affection with which the family circle is now united, would be at an end if matrimonial connexions could be formed among its members;

and even with the present restrictions intermarriages in families are frequently productive of the most injurious consequences in respect of mental and bodily health.

Affinity or relationship by marriage is an impediment arising out of moral considerations alone. The extent to which this impediment has been carried has also varied.

The impediment to marriage arising out of consanguinity applies in the same degree to illegitimate as to legitimate relations, and the impediment resulting from affinity is created by illicit connexion as well as by marriage. The Council of Trent restricted the impediment of affinity arising out of illicit connexion to the second degree.

2. Each party must have the will to contract marriage with the other. An idiot therefore, who cannot understand the nature of the conjugal relation, is incapable of contracting marriage. So is a lunatic, except during a lucid interval. But however absurd it may appear, children are presumed to have sufficient intelligence to understand the nature of the marriage engagement at seven; and though the contract is not absolutely binding upon them until they reach the age of consent, still the marriage of a child above the age of seven would prevent its forming a second marriage until the age of consent, as until that age it cannot dissent from the first marriage.

3. There must be an actual contract of marriage. This, at common law, might be by words of present contract, which would, without more, constitute a perfect marriage,—or by words of future contract, followed by cohabitation.

The unlimited freedom of marriage was first broken in upon in England by the Marriage Act of 1753 (26 Geo. II., c. 33), the principal provisions of which form the basis of the law as it now stands. Many of these provisions are taken from the canon law, an observance of which was, before this statute, necessary to constitute a *regular* marriage, though a marriage contracted without them was *valid*.

The restrictions upon the common-law freedom of marriage are now embodied in two statutes.

The 4 Geo. IV., c. 76, contains the following provisions: Banns of matrimony are to be published in the church, or a public chapel in which banns are allowed to be published, of the parish or chapelry wherein each of the parties dwells, immediately after the second lesson of morning service, or of evening service if there be no morning service, upon three Sundays preceding the solemnization (s. 2). Notice of the names of the parties, their place of abode, and the time during which they have dwelt there, is to be delivered to the minister seven days before the first publication (s. 7). Banns are to be republished on three Sundays, if marriage do not take place within three months after publication completed (s. 9). No licence of marriage (that is, dispensation from the obligation to publish banns) is to be granted to solemnize marriage in any church or chapel not belonging to the parish or chapelry within which the usual place of abode of one of the parties has been for fifteen days immediately before the granting of the licence (s. 10). Extra-parochial places are to be taken to belong to the parish or chapelry next adjoining (s. 12). Upon obtaining a licence, one of the parties must swear that he or she believes that there is no impediment of kindred or alliance (consanguinity or affinity), or of any other lawful cause, nor any suit commenced in any ecclesiastical court, to hinder the marriage, and that one of the parties has, for fifteen days immediately preceding, had his or her usual place of abode within the parish or chapelry; and where either of the parties, not being a widower or widow, is under the age of twenty-one, that the consent of the person or persons whose consent is required by that act has been obtained, or that there is no person having authority to give such consent (s. 14). The father, if living, of any party under twenty-one, not being a widower or widow, or, if the father be dead, the guardian or guardians of the person of such party, or one of them, and in case there be no guardian, then the mother of such party if unmarried, and if there be no mother unmarried, then the guardian or one of the guardians of the person appointed by the Court of Chancery, has authority to give consent to the marriage of such party; and such consent is required, unless there be no person authorised to give it (s. 16). In case of the father, guardian, or mother being *non compos mentis*, or beyond sea, or unreasonably or from undue motives refusing or withholding consent, any person desirous of marrying may petition the lord-chancellor, master of the rolls, or vice-chancellor; and in case the marriage proposed shall, on examination, appear to be proper, the lord-chancellor, &c., may judicially declare the same to be so; and such declaration shall be equivalent to consent of the father, &c. (s. 17). If a marriage be not had within three months after licence, marriage cannot be solemnized without a new licence or banns (s. 19). The archbishop of Canterbury is authorised to grant special licences to marry at any convenient time or place (s. 20). If any persons, knowingly and wilfully, intermarry in any other place than a church or such public chapel, unless by special licence, or, knowingly and wilfully, intermarry without the publication of banns and licence, or, knowingly and wilfully, consent to the solemnization of such marriage by a person not being in holy orders, the marriage is null and void (s. 22). (It has been held, that in order to invalidate a marriage under this section, both parties must know the irregularity of the proceeding.) When a marriage is solemnized between parties, both or one of them being under age, by false oath or fraud, the marriage is valid, but the guilty party is to forfeit all property accruing from the marriage (s. 23). After the solemnization of any marriage by banns or licence, no proof can be required of actual dwelling or usual place of abode, nor can any evidence be received to prove the contrary (s. 26). Marriages are to be solemnized in the presence of two witnesses besides the minister, and registered.

The principal provisions of 6 & 7 Wm. IV., c. 85, which was passed chiefly in ease of those who scrupled at joining in the services of the Established Church, are these:—Marriages may be solemnized on production of the registrar's certificate, under the provisions of that act, in like manner as after publication of banns (s. 1). In every case of marriage intended to be solemnized according to the rites of the Church of England, unless by licence or special licence, or after publication of banns, and in every case of marriage intended to be solemnized according to the usages of the Quakers or Jews, or according to any form authorised by that act, one of the parties is to give notice, according to the form set out in the act, to the superintendent registrar of the district or each of the districts within which the parties have dwelt for seven days then next preceding, stating the name and surname, and the profession or condition, and the dwelling-place of each, and the time (not less than seven days) during which each has dwelt therein, and the church or building in which the marriage is to be solemnized (s 4).

After the expiration of seven days, if the marriage is to be solemnized by licence (that is, from the surrogate, or officer of the ecclesiastical court), or of twenty-one days, if without licence, the superintendent registrar, upon request, is to issue a certificate, provided no lawful impediment be shown, stating the particulars set forth in the notice, the day on which it was entered, that the full period of seven days or of twenty-one days has elapsed since the entry of such notice, and that the issue of such certificate has not been forbidden by any authorised person (s. 7). (This provision does not apply to marriages by licence celebrated according to the rites of the Church of England.) The like consent is required to a marriage solemnized by licence, as would have been required to marriages by licence before the passing of the act (that is, by 4 Geo. IV., c. 76, s. 16 & 17); and every person whose consent to a marriage by licence is required by law is authorised to forbid the issue of the superintendent registrar's certificate (s. 10). Every superintendent registrar may grant licences for marriage in any building registered within any district under his superintendence, or in his office (s. 11). Before any licence for marriage can be granted by a superintendent registrar, one of the parties must appear personally before him, and must, in case the notice of the intended marriage has not been given to the same superintendent registrar, deliver to him the certificate of the superintendent registrar or registrars to whom such notice has been given; and such parties must make oath, affirmation, or declaration, that he or she believes that there is not any impediment of kindred or alliance, or other lawful hindrance, to the marriage, and that one of the parties has for fifteen days immediately before the day of the grant of the licence (or rather the day of the making of the oath, &c.), had his or her usual place of abode within the district in which such marriage is to be solemnized; and where either party, not being a widower or widow, is under twenty-one, that the consent of the person or persons whose consent to such marriage is required by law has been obtained thereto, or that there is no person having authority to give such consent (s. 12). No marriage after notice, unless by virtue of a licence by the superintendent registrar, is to be solemnized or registered until after the expiration of twenty-one days after entry of notice, and no marriage is to be solemnized by the licence of any superintendent registrar, or registered, until after the expiration of seven days after the day of the entry of notice (s. 14). Whenever a marriage is not had within three calendar months after notice entered by the superintendent registrar, the notice and certificate, and any licence granted thereupon,and all other proceedings, become utterly void; and no person can proceed to solemnize the marriage, nor can any registrar register the same, until new notice, entry, and certificate (s. 15). The certificate of the superintendent or (superintendents) is to be delivered to the officiating minister, if the marriage is to be solemnized according to the rites of the Church of England; and such certificate or licence is to be delivered to the registering officer of Quakers for the place where the marriage is solemnized, if the same shall be solemnized according to their usages; or to the officer of a synagogue by whom the marriage is registered, if to be solemnized according to the usages of persons professing the Jewish religion; and in all other cases it is to be delivered to the registrar present at the marriage (s. 16).

Any proprietor, or trustee, of a separate building, certified, according to law, as a place of religious worship, may apply to the superintendent registrar, in order that such building may be registered for solemnizing marriages therein; and in such cases he is to deliver to the superintendent registrar a certificate signed in duplicate by twenty householders, that such building has been used by them during one year as their usual place of public religious worship, and that they are desirous that the place shall be registered; each of which certificates is to be countersigned by the proprietor or trustee by whom the same is to be delivered, and the superintendent registrar is to send both certificates to the registrar-general, who is to register such building accordingly, and indorse on both certificates the date of the registry, and to keep one certificate with the other records of the general register office, and to return the other certificate to the superintendent registrar, who is to keep the same with the other records of his office; and the superintendent registrar is to enter the date of the registry of such building, and is to give a certificate of such registry under his hand, on parchment or vellum, to the proprietor or trustee by whom the certificates are countersigned, and is to give public notice of the registry thereof, by advertisement in some newspaper circulating within the county and in the ‘London Gazette’ (s. 18).

After the expiration of the twenty-one days, or of seven days, if the marriage is by licence (that is, from the surrogate), it may be solemnized in the registered building stated in the notice, between and by the parties described in the notice and certificate according to such form and ceremony as they may see fit to adopt: every such marriage to be solemnized with open doors between eight and twelve in the forenoon, in the presence of some registrar of the district in which the building is situate, and of two witnesses.

In some part of the ceremony, and in the presence of registrar and witnesses, each of the parties is to declare—

> ‘I do solemnly declare, that I know not of any lawful impediment why I, A. B., may not be joined in matrimony to C. D.’

And each of the parties is to say to the other—

> ‘I call upon these persons here present, to witness that I, A. B., do take thee, C. D., to be my lawful wedded wife (or husband).’

Provided also, that there be no lawful impediment to the marriage of such parties (s. 20). Persons who object to marry in any such registered building may, after due notice and certificate issued, contract and solemnize marriage at the office of the superintendent registrar, and in his presence and in that of some registrar of the district, and of two witnesses, with open doors, and between the hours aforesaid, making the declaration and using the form of words as above (s. 21). After any marriage solemnized, it is not necessary, in support of such marriage, to give proof of the actual dwelling of either of the parties previous to the marriage within the district for the time required by the act, or of the consent of any person whose consent is required; nor is evidence admissible to prove the contrary in any suit touching the validity of such marriage (s. 25). The registrar before whom any marriage is solemnized according to the provisions of this act may ask of the parties to be married the several particulars required to be registered touching such marriage (s. 36). Every person knowingly and wilfully making any false declaration, or signing any false notice or certificate required by this act, for the purpose of procuring any marriage, and every person forbidding the issue of any superintendent registrar's certificate by falsely representing himself or herself to be a person whose consent to such marriage is required by law, knowing such representation to be false, is to suffer the penalties of perjury (s. 38). If any person knowingly and wilfully intermarry under the provisions of this act,—in any place other than the church, chapel, registered building, or office, or place specified in the notice and certificate,—or without due notice to the superintendent registrar,—or without certificate of notice duly issued,—or without licence, in case a licence is necessary,—or in the absence of a registrar, where the presence of a registrar or superintendent registrar is necessary, the marriage of such persons, except in certain excepted cases, is null and void (s. 42); as under 4 Geo. IV., c. 76, s. 22, a marriage would not be void unless *both* parties knowingly and wilfully concurred in marrying contrary to the provisions of the 42nd section. If any valid marriage be had under the provisions of this act by means of any wilfully false notice, certificate, or declaration made by either party to such marriage, as to any matters to which a notice, certificate, or declaration is required, the attorney-general or solicitor-general may sue for a forfeiture of all estate and interest in any property accruing to the offending party by such marriage (s. 43). Consent to marriage may be withdrawn upon good reason; but it would rather appear that this cannot be done merely because the parent or guardian has changed his mind. The question of consent is not however of such vital importance as under the first Marriage Act (26 Geo. II., c. 33, s. 11), which made marriages without consent of parents, &c. absolutely void. Under 4 Geo. IV., c. 76, s. 23, and 6 & 7 Wm. IV., c. 85, s. 43, a false statement as to consent subjects the fraudulent party to the penalties of perjury, and to a forfeiture of all estate and interest in any properties accruing by the marriage, but leaves the marriage itself in full force.

These statutes do not extend to marriages contracted out of England, or to marriages of the royal family, which are regulated by a particular statute, 12 George III., c. 11.

Before 1835 marriages within the prohibited degrees of consanguinity and affinity were valid until annulled by a declaratory sentence of the ecclesiastical court, after which they became void ab initio, and the issue of such marriages were, by such sentence, rendered illegitimate; and the law is still so with respect to personal incapacity existing at the time of the contract. But as the ecclesiastical court could, professedly, only proceed *pro salute animæ*, and its authority to annul an incestuous marriage was founded upon the duty of putting a stop to the incestuous intercourse, the power of annulling the marriage ceased upon the death of either of the parties. The validity of such marriage, and the legitimacy of the issue, depended therefore upon the contingency of a suit being instituted and a sentence pronounced, during the joint lives of the husband and wife. But now, by 5 and 6 Will. IV., c. 54, all marriages thereafter celebrated between persons within the prohibited degrees of consanguinity or affinity are absolutely void to all intents and purposes. And, even at common law, a marriage contracted while there is a former wife or husband alive is ipso facto void, without any declaratory sentence.

Generally speaking, a marriage, valid according to the law of the country in which it was contracted, is valid in every other country. This rule is however subject to some exceptions, as where marriages, contracted according to the law of the country (*lex loci*), are considered, in the courts in which their validity happens to be contested, as contracted in violation of some principle of natural religion or morality, or as where, in Persia or Turkey, a man marries a second wife in the lifetime of the first.

A constitution of the emperor Constantine, restored in 476 by the emperor Zeno (*Cod.*, lib. 5, tit. 27, l. 5), enabled the husband of a concubina who had children by her, without having had any child ex justis nuptiis, to raise the concubina to the dignity of justa uxor, and to confer on those children the privilege of children born ex justis nuptiis, though actually born ex concubinatu. ‘Divi Constantini, qui venerandâ Christianorum fide Romanum munivit imperium, super *ingenuis* concubinis ducendis uxoribus,

filiis quinetiam ex iisdem, vel ante matrimonium, vel postea progenitis, suis ac legitimis habendis, sacratissimam constitutionem renovantes, jubemus eos, qui ante hanc legem, ingenuarum mulierum nuptiis minimè intercedentibus, electo contubernio, cujuslibet sexus filios procreaverint: quibus nulla videlicet uxor est, nulla ex justo matrimonio legitima proles suscepta: si voluerint eas uxores ducere, quæ antea fuerant concubinæ tum conjugium legitimum cum hujusmodi mulieribus ingenuis (ut dictum est) posse contrahere, quam filios utriusque sexus ex earundem mulierum priore contubernio procreatos, mox postquam nuptiæ cum matribus eorum fuerint celebratæ, suos patri, et in potestate fieri: et cum his, qui postea ex eodem matrimonio suscepti fuerint, vel solos (si nullus alius deinde nascatur) tam ex testamento volentibus patribus etiam ex integro succedere, quam ab intestato petere hereditatem paternam, &c.'

This was carried still further when marriage was invested with a religious character. Its efficacy as a sacrament was regarded as so powerful, as to have a retrospective operation upon children born at a time when there was no semblance or intention of marriage of any kind, provided that at the time of the birth there existed no impediment to the marriage of the parents. Alexander III., who filled the papal chair from 1159 to 1181, pronounces that 'Tanta est vis matrimonii, ut qui antea sunt geniti, post contractum matrimonium, legitimi habeantur.' *Extravag.*, cap. 6, 'Qui filii sunt legit.' (Pothier, *Traité du Contrat de Mariage.*) This modification of the law of legitimacy, though frequently recommended by the clergy, was never adopted in England by the laity. It is however the law of Scotland and of France, and of most other Catholic countries.

MARRIAGE, ROMAN. The right conception of the Roman institution of marriage and of its legal consequences is essential to enable us to approximate to a right understanding of the old Roman polity.

Children were in the power of their father [EMANCIPATIO] only when they were the offspring of a legal marriage (justæ nuptiæ, or justum matrimonium). The cases of legitimation and adoption need not be considered here. To constitute such a legal marriage there must be between the parties *connubium*, the nature of which condition is best explained by an example:—Between a Roman citizen and the daughter of a Roman citizen there was *connubium*, and as a consequence the children of such marriage were Roman citizens, and in the power of their father. Between a Roman citizen and a female slave (ancilla) there was no *connubium*, and consequently the children which sprung from such a union were not Roman citizens. Whenever there was no *connubium*, the children followed the condition of the mother: when there was *connubium*, they followed the condition of the father. Various degrees of consanguinity, as the relation of parent and child, prevented *connubium* between parties in such a relation. After the emperor Claudius had married Agrippina, his brother's daughter, such relationship was no longer an impediment to a legal marriage; but the licence was carried no further than the terms of the decretum of the senate warranted, and the marriage of an uncle with his sister's daughter remained, as before, an illegal union. (Tacit., *Annal.*, xii. 7; Gaius, i. s. 62.) Further, to constitute a legal marriage, the two parties must be of sufficient bodily maturity; both parties also must consent, if they are capable of giving a legal consent (sui juris); or if not, their parents must consent.

The ceremonial parts of the marriage were of three kinds, by any one of which the wife was said to come into the hand of the husband (in manum), and to occupy the legal relation of a daughter. A woman who lived for one year with a man without interruption became his wife by virtue of this cohabitation (usus). As in the case of all moveables, by the laws of the Twelve Tables, one year's enjoyment of a thing transferred the ownership of it, so by one year's uninterrupted cohabitation the husband acquired that interest in the wife which was the result of complete marriage. The Twelve Tables provided that if the wife wished to avoid the legal effect of this cohabitation, it was only necessary to absent herself from her husband for three nights during the year, which would be a sufficient legal interruption to the usus. In the time of Gaius this part of the old law had been partly abolished by enactments, and had partly fallen into disuse.

The Confarreatio, so called from the use of a loaf of bread on the occasion, appears to have been of the nature of a religious ceremony, and it existed in the time of Gaius. It appears that certain offices, such as that of Flamen Dialis, could be held only by those who were born of parents who had been married by the ceremony of Confarreatio. (Gaius, i. 112; Tacit., *Ann.*, iv. 16.)

The Coemptio was, in form, a sale (mancipatio) before five witnesses. [MANCIPIUM.] The Coemptio might be made either between a woman and her intended husband, in which case she became, in contemplation of law, his daughter, or between a woman and a stranger (fiduciæ causa), which was a necessary legal process in case a woman wished to change one guardian for another, or to acquire the privilege of making a will. For until the senascultum passed in the time of Hadrian no woman could make a testamentary disposition (with the exception of certain privileged persons), unless she had contracted the Coemptio, that is, had been sold, and then resold and manumitted. The Coemptio, being effected by mancipatio, worked a legal change of status (*Dig.*, iv., tit. 5, s. 1), or *diminutio capitis;* and it was the least of the three kinds of *diminutio capitis*, or that by which a person underwent no change in his civil capacity, except the being transferred into another family. (Paulus, *Dig.*, iv., tit. 5, s. 11.) This explanation will render intelligible the passage of Cicero on the testamentary power of women (*Topic.*, 4), taken in connection with Gaius (i., s. 115, &c.). The essays of Hoffmann and Savigny in the 'Zeitschrift für Geschichtliche Rechtswissenschaft,' vol. iii., p. 309, &c., may also be read with advantage.

A gift from husband to wife, or from wife to husband, was void (with some few exceptions). The transaction was the same as if nothing had been done. The Donatio mortis causâ, or divortii caussâ, in contemplation of death, or in consideration of divorce, was a valid gift.

There could be no *dos* (marriage portion), unless there was justum matrimonium. The term *dos* comprehended both what the wife brought to the husband on her own account, and what was given or contracted to be given by any other person, in consideration and for the purposes of the marriage. (*Dig.*, xxiii., tit. 3, s. 76.) When the *dos* came from the wife's father, it was called *profecticia*, but when from any other person, *adventicia*. It was a general rule that the *dos adventicia* remained with the husband, unless there was some agreement to the contrary, in which case it was called *dos recepticia*. What came into the husband's possession, not as *dos*, was included in the term Parapherna (παράφερνα), or Paraphernalia, and did not become the property of the husband. All kinds of property could be the subject of *dos*. If they were things that could be estimated by number, weight, and measure (res fungibiles), the husband took them, subject to the liability, in case of a dissolution of the marriage, of restoring things to the same number, weight, and measure. Things given as *dos* might be valued or not valued: in case they were valued, the complete ownership of them passed to the husband, inasmuch as the valuation was in the nature of a sale, and the husband could dispose of the things as he pleased, subject only to the liability of restoring their value, in case of a dissolution of the marriage. If the things were not valued, and any loss ensued, without the fault or culpable neglect of the husband, the loss fell on the wife. In the case of things which were not fungibiles or not valued, the ownership during the marriage might be considered as in the husband, and as returning to the wife on the dissolution of the marriage. In such a case the husband could manage the wife's property as his own; he enjoyed the profits of it during the marriage, and could sell it. With some exceptions however he could not sell or dispose of the wife's immoveable property which was included in the *dos* (dotale praedium). (Gaius, ii., s. 63; *Instit.*, ii., tit. 8.) The portion became the husband's on the solemnization of the marriage, and he had the profits of it during the marriage. In the case of divorce the portion, or a part of it, according to circumstances, was restored. In case the wife died during the subsistence of a marriage, part returned to her father, and part remained to the children of the marriage, if any; but it might, by the terms of the marriage contract, become the husband's, even if there were no children of the marriage. As to the portion of the wife, whatever might have been originally the rights of the husband over it by virtue of the marriage, it was in later times the subject of the express stipulations of the marriage settlement. The questions of law which arose on the subject of the *dos* were numerous and sometimes difficult.

In enumerating the modes by which a man may acquire property *per universitatem*, Gaius mentions marriage, by which a woman comes *in manum viri*, and he observes that all things pass to the husband. The meaning of this passage is perhaps not quite certain; but it is partly explained by what has been already said.

(*Dig.* 23, tit. 3, 'De Jure Dotium;' tit. 5, 'De Fundo dotali;' Ulpian, *Frag.* vi., 'De Dotibus;' Thibaut, *System des Pandekten-Rechts.*)

MARROW, or **MEDULLA**, is the fat contained in the osseous tubes and cells of the bones. [Bone.] It consists of an oily fluid, contained in minute vesicles, which are usually collected into bunches and enclosed in spaces surrounded by bony walls. It is most abundant in the cavities of the long bones, and in the spongy tissue of their articular extremities, and of the short rounded bones.

Spinal marrow and medulla spinalis are names sometimes applied to the spinal chord. [Nerves.]

MARRU'BIUM VULGA'RE (White Horehound), a biennial or perennial herbaceous plant, common by roadsides, the officinal part of which is the leaves; these are to be collected without the stalks. They are of a whitish-grey woolly appearance, possessed of a faint odour, which becomes less by drying, and a bitter sharp taste. Ten pounds of leaves yield four pounds of extract. Their chief constituents are a bitter extractive, with a volatile oil, and probably some astringent matter.

White horehound, when young, is apt to be confounded with many other labiate plants, particularly the Ballota nigra, or black horehound, which possesses a disagreeable odour. The medicinal properties of horehound are very insignificant, being demulcent, slightly tonic, and astringent. As a popular remedy, it enjoys great favour in many pulmonary complaints; but the preparations vended under the name of horehound often contain more efficient ingredients, to which they owe their success.

MARS, the planet which comes next to the earth, in order of distance from the sun, is a brilliant star of a slightly red tint. On examination in a telescope, this colour is found to belong to parts of the surface of the planet which have been conjectured to be land; the rest, which appears somewhat green, being supposed to be sea. Certain white spots, which appear at each pole after the winter of its hemisphere, and disappear during its summer, have been conjectured to be snow. The apparent diameter of Mars varies from 3″·6 to 18″·28, being 6″·29 when the planet is at its mean distance from the earth. The real diameter is ·517 of that of the earth, or about 4100 miles. Its bulk is ·1386 of that of the earth, and its mass is ·0000003927 of that of the sun, or about the 2546000th part.

The planet revolves on its axis in $24^{h}\ 39^{m}\ 21^{s}\cdot3$, and the axis is inclined to the ecliptic 30° 18′ 10″·8. Its light and heat are 43 per cent. of those of the earth.

Elements of the Orbit of Mars.

Epoch 1799, December 31, 12^{h} mean astronomical time at Seeberg.

Semiaxis major 1·5236923, that of the earth being assumed as the unit.

Excentricity ·0933070; its secular increase (or increase in 100 years) ·000090176.

Inclination of the orbit to the ecliptic 1° 51′ 6″·2; its secular alteration insensible.

Longitudes from the mean equinox of the epoch (1.) of the ascending node 47° 59′ 38″·4; its secular increase (combined with the precession) 2500″; (2.) of the perihelion 332° 22′ 51″; its secular increase (combined with the precession) 6582″; (3.) of the planet (mean) 232° 33′ 23″·2.

Mean sidereal motion in one mean solar day, 31′ 26″·655; in 365¼ days 689100″·739; sidereal revolution 686·9796458 mean solar days.

MARS, or **MAVORS** (called *Mamers* in the Oscan language), the god of war among the Romans, generally considered as corresponding to the Greek *Ares*. He was also called Marspater or Marspiter (Gell., v. 12), and was worshipped in peace under the name of Quirinus, and in war under that of Gradivus. There was a temple in Rome sacred to Quirinus, and another outside the city, in which he was worshipped under the name of Gradivus, on the Appian Way, near the gate Capena (Servius on *Æneid*, i. 296). According to tradition, Romulus was the son of Mars, by Rea Silvia; and it was perhaps owing to his being the tutelar god of the Romans that the husbandmen were accustomed, according to Cato (*De Re Rust.*, c. 141), to present their prayers to this deity, when they purified their fields by performing the sacrifice called *suovetaurilia*, which consisted of a pig, a sheep, and a bull. He is also called by Cato, Mars Silvanus (c. 83). According to a principle in Roman mythology, by which a male and a female deity are always supposed to preside over the same object of fear or desire, the Romans had a goddess of war called Bellona.

A round shield (*ancile*), which was supposed to have been the shield of Mars, is said to have fallen from heaven during the reign of Numa, and was entrusted to the care of the Salii, the priests of Mars. Eleven other shields were made like it, in order that it might not be stolen.

The first month (Martius) of the old Roman year, which consisted of ten months only, derived its name from this god.

Mars is generally represented with a beard, but in other respects like the Greek Ares, and is frequently placed in the same group with Rea Silvia. (Müller, *Archæologie der Kunst*, p. 492.) For the Greek god of war, see Ares.

MARSA'LA, a town at the western extremity of Sicily, built near the site of the antient Lilybœum, the port of which is filled up. There is however good anchorage, sheltered by a small island which lies off the coast, and which is mentioned in the history of the siege of Lilybœum by the Romans.

The present town of Marsala, which was built by the Saracens, contains about 10,000 inhabitants, and belongs to the intendenza or province of Trapani. [Trapani.] The country around produces very good white wine, which is prepared for exportation by an English mercantile house established there, and is known by the name of Marsala. It is exported in great quantities to Malta, and also to England. There are very few remains of antiquity, except some traces of former aqueducts and tombs scattered about the country.

MARSAN, a subdivision of Gascogne, in France, now included in the department of Landes. Mont de Marsan was its capital. [France; Guienne et Gascogne; Landes.]

MARSDEN, WILLIAM, a distinguished Oriental scholar, was born in Dublin, on the 16th of November, 1754. He was of a Derbyshire family which had settled in Ireland at the end of the reign of Queen Anne. John Marsden, his father, was the son of one of the original settlers, and was established in Dublin as a merchant on a large scale. The subject of this article was his tenth child. After going through the usual course of classical education in the schools of Dublin, he was about to be entered at Trinity College with a view to the church, when his destinies led him to take a very different course. His eldest brother had before proceeded to Bencoolen as a civil servant of the East India Company; and sending home a very favourable account of his prospects, the father was induced to apply for another appointment in the same quarter for William, which proved successful. He was accordingly removed from school, and in the beginning of the year 1771, when he was but 16 years of age, he embarked for India, and arrived at Bencoolen in May of the same year. Here his assiduity, intelligence, and integrity quickly secured to him such distinction as a small establishment and community afforded. He became first sub-secretary, and soon after principal secretary to the government. The duties of these stations were not very laborious, and afforded ample leisure for study and inquiry. Mr. Marsden mastered the vernacular language of the country, the Malay, and at the same time laid in that stock of local knowledge which, being embodied afterwards in his publications, was the foundation of his fame as a writer.

Mr. Marsden's whole stay in Sumatra did not exceed eight years, but how well and diligently he employed this brief period can only be sufficiently appreciated by those who, like the writer of this article, have been engaged in the same pursuits. But he felt that his powers were wasted in the narrow field in which they were exercised, and he determined upon an experiment, usual in such a case as his, that of returning to England to push his fortune. He felt that, at all events, literary leisure, independence, and a congenial climate would be assured to him by this step.

Having this object in view, he quitted Sumatra in the summer of 1779, and in the last days of the same year arrived in England, with good health, but with a very trifling income of a few hundred pounds a year. His first attempt was to procure a small post under the government; but, failing in this, he resolved on a literary retirement, and on supplying the want of wealth by a prudent economy; and if he afterwards abandoned this course, his departure from it cannot be said to have been of his own seeking. Shortly after his return to England he made the acquaintance of the late Sir Joseph Banks, and at his philosophical breakfasts met and acquired the friendship of some of the most eminent men of the day, Solander, Maskelyne, Dalrymple, Rennell, and Herschel. He soon became a Fellow of the Royal Society, and eventually of almost every learned or scientific society of eminence in the kingdom. His literary reputation was insured by the publication, in 1782, of the well-known 'History of Sumatra.' This work, which has come to a third edition, and has been translated into French and German, has maintained its reputation with the public for the long period of 56 years. It has the peculiar impress of Mr. Marsden's mind, strong sense, truthfulness, and caution. In so far as our language at least is concerned, it may be considered as the first book of Oriental travels which, with a thorough and intimate personal knowledge of local details, combines philosophy, science, and a liberal acquaintance with letters. For 14 years after his return to England Mr. Marsden's time was devoted wholly to literature and science; and in this manner it was his fixed intention to have passed the rest of his life. In 1782 he had resisted the temptation of going to India with Admiral Sir Hyde Parker, with the lucrative office of secretary; and, in 1787, the certainty, under the auspices of the leading parties at the India House, of becoming an East India Director. In 1795 however, invited by Earl Spencer, on the recommendation of his intimate friend, the celebrated geographer, Major Rennell, he accepted the situation of second secretary; and in due course of time the secretary of the little Bencoolen government, and the author of the 'History of Sumatra' became chief secretary to the British board of Admiralty, with the war salary of 4000*l.* per annum. In this matter however it is evident that Mr. Marsden rather yielded to the advice of his friends than consulted his own inclination. No man at the same time could be better fitted, by diligence, official training, integrity, and general intelligence, to discharge the various functions which he was called upon to perform, and he did so discharge them for a period of 12 years, greatly to his own honour and the public advantage. This period too comprehended the most eventful and glorious in the history of the British navy, for it embraced the victories of Cape St. Vincent, Camperdown, the Nile, and Trafalgar. In 1807 Mr. Marsden, whose health began to suffer severely by the laborious discharge of the very onerous duties of his office, tendered his resignation of the secretaryship to the Admiralty, and retired on a pension of 1500*l.* per annum. The first solid fruits of Mr. Marsden's leisure were the publication, in 1812, of his Grammar and Dictionary of the Malay language, the most difficult, elaborate, and, we may perhaps add, the most likely to endure of his literary labours. A portion of the materials he had of course brought with him from Sumatra, and we find him engaged in the compilation of the Dictionary as far back as 1786. The eventual publication of these works however did not take place until 33 years after he had quitted Sumatra, and, consequently, after he had ceased to receive any assistance from native instructors. When we consider therefore the accuracy and erudition by which they are so eminently characterized, we must look upon them as affording the highest proofs of happy industry and acuteness.

After the lapse of twenty-six years, they still continue, as they are likely long to continue, the only standard works on Malayan philology. Translations of them have been made, under the auspices of the Netherland government, both into the French and Dutch languages. In 1817 he published his 'Translation of the celebrated Travels of Marco Polo.' The translation has been made with Mr. Marsden's accustomed accuracy, and is accompanied by a commentary far more valuable than the translation itself. In 1823 he published the first part, and in 1825 the second, of his 'Numismata Orientalia, or Description of Eastern Coins,' a valuable collection of which had fallen into his hands by purchase. This is a work of great care and learning, in which, as well as in some respects in the compilation of the Malayan Dictionary, he had the invaluable assistance of his learned relative Sir Charles Wilkins. In 1832, in his seventy-eighth year, Mr. Marsden published his last work, comprising three Essays, the longest, most elaborate, and important of which is on the Polynesian or East Insular Languages, a subject which had long engaged his attention and was a great favourite with him. He was indeed the first that pointed out the existence of a considerable body of Sanscrit words in all the cultivated Polynesian languages, and also the singular connexion which exists among these languages themselves, extending from Madagascar to Easter Island. In 1831 Mr. Marsden voluntarily relinquished his pension to the public, an act of liberality and generosity which, at the time, had no example, and has had very few since. It met, as it well deserved, the warmest applause of the House of Commons. In 1834, feeling, as he himself says, the increasing infirmities of age, he determined in his life-time to bestow his rich collection of coins and medals and his extensive library of books and Oriental manuscripts in such a manner as would make them most serviceable to the public. The coins and medals he gave to the British Museum, and his library to the newly-founded King's College. In 1833 he had a slight apoplectic attack, and in 1834 and 1835 a second and third. These greatly enfeebled his body, leaving him however in the entire possession of his memory. The final and fatal attack did not take place until the 6th of October, 1836, when, at seven o'clock in the morning, after passing a tranquil night, he gently expired, hardly uttering a groan, in the eighty-second year of a happy, prosperous, and well-spent life. Agreeably to his own directions, he was interred in the cemetery at Kensal Green. In 1807, shortly after quitting the Admiralty, Mr. Marsden married the eldest daughter of his old and intimate friend the late Sir Charles Wilkins; and notwithstanding the great disparity in the ages of the parties, the connexion, which lasted near thirty years, was one of much satisfaction and happiness, the result, on both sides, of exemplary prudence, good sense, and high principle. His widow is the judicious and accomplished editor of the 'Autobiographical Memoir' from which we have extracted this brief account, and which has been printed for private circulation only, and not published.

MARSEILLE, a seaport and city in France, capital of an arrondissement in the department of Bouches du Rhône. It is on the coast of the Mediterranean, 408 to 410 miles in a direct line south-south-east of Paris, or 497 miles by the road through Auxerre, Châlons-sur-Saône, Lyon, Valence, Avignon, and Aix, in 43° 18′ N. lat. and 5° 23′ E. long.

Marseille was founded by the inhabitants of Phocæa (Φωκαία), a Greek town which was a member of the Ionian confederation. [IONIA.] The Phocæans founded several colonies in the western part of the Mediterranean, of which Massilia, as the Latins generally wrote it, or Massalia (Μασσαλία) according to the usual Greek orthography, was perhaps the earliest, as it certainly was the most important. Two colonies of Phocæans successively established themselves in the place, the first about B.C. 600, while Phocæa was yet flourishing. The leader of this original colony, called by Aristotle (ʽΗ Μασσαλιωτῶν Πολιτεία, quoted in Athenæus Δειπνοσοφισταί, lib. x.) Euxenus (Εὔξενος), having found favour in the eyes of Petta (Πέττα), daughter of Nanos (Νάνος), king of the Segobrigians, a tribe probably of Ligurians (Justin., *Hist.*, c. xliii.), received her in marriage, and also permission to found a city. The circumstances are related, with some variation, by Justin.

The new colony was early involved in hostilities with the native tribes, Ligurian and Celtic, over whom the Massilians obtained several victories, and established new settlements along the coasts, in order to retain them in subjection. The surrounding barbarians acquired from the new settlers some of the arts of civilised life: they learned to prune and train the vine, and to plant the olive. The Massilians had also to contend with the power of the Carthaginians (the commercial rivals of the Greeks in western Europe), whom they defeated in a sea-fight of early but uncertain date. (Thucyd., lib. i., c. 13.)

The second colonization of Massilia took place about B.C. 544, on occasion of the Phocæans quitting their native city to avoid the subjection with which they were threatened by the Persians. Herodotus does not notice the fact of any of these Phocæans settling at Marseille: he says that they sailed to Alalia in Corsica, which was a Phocæan colony, and commenced piracy. The Tyrrheni and Carthaginians uniting against them, a great sea-fight took place, in which the pirates obtained a dear-bought victory. After this battle they left Corsica for Rhegium. (Herod., i. 165-167.)

The Massilian constitution was aristocratic; their laws and their religious rites were similar to those of the Ionians of Asia. The worship of the Ephesian Artemis, or Diana, was cherished with peculiar reverence, both in Massilia itself and in its colonies. The governing body was a senate (*συνέδριον*) of 600 persons, called Timuchi (*τιμοῦχοι*), who were appointed for life. This senate had fifteen presidents (*προεστῶτες*), who formed a sort of committee, by which the ordinary business of the government was managed. Of this committee three persons possessed the chief power. The Timuchi were chosen from among those who had children, and in whose families the right of citizenship had been possessed by three generations. (Strabo, lib. iv.)

The Massilians, like the Phocæans, were a naval people; they had several colonies or posts on the coasts both of Gaul, Spain, and Italy: as Emporium (Ἐμπόρειον), now Ampurias, in Spain; Rhöe Agatha (Ῥόη Ἀγαθὴ), now Agde; Tauroeis (Ταυρόεις), or Tauroentium (Ταυροέντιον), now Tarente, near La Ciotat; Antipolis (Ἀντίπολις), now Antibes; Olbia (Ολβία), perhaps the port and castle of Leoube, between Hieres and St. Tropez; and Nicæa (Νίκαια), now Nice. They early and steadily cultivated an alliance with the Romans, which alliance was gradually converted into subjection. In the civil war of Pompey and Cæsar they embraced the party of the former; and receiving L. Domitius, one of his most zealous partisans, within their walls, and appointing him governor of the city, they closed their gates against Cæsar, under pretence of preserving neutrality (B.C. 49). Cæsar, hastening into Spain against Afranius and Petreius, after building and equipping a squadron with marvellous celerity, left his lieutenant C. Trebonius with three legions to carry on the siege, and appointed D. Brutus to command his fleet. In the first naval encounter the townsmen were defeated, with the loss of nine vessels. But the place was well stored with warlike machines; and the townsmen being encouraged by the arrival of L. Nasidienus, who was sent by Pompey to their aid, with a squadron of seventeen ships, they refitted their fleet, and put to sea to join him; but the confederate fleet being defeated by D. Brutus, and an attempt to destroy the machines which Trebonius had prepared for the attack of the city having failed, they were induced to apply for an armistice: this, when obtained, they violated by an attack in which they seriously damaged the works of Trebonius; but these being repaired, they again implored an armistice; and on Cæsar's return from his victory over the Pompeians in Spain, they surrendered to him. Cæsar did not reduce them into entire subjection, but left two legions in garrison while he marched forward into Italy. (Cæs., *De Bell. Civ.*, lib. i. 34-36, 56, 57; ii. 1-16, 22.)

The municipal government of Massilia remained unaltered, but its political independence was virtually overthrown. The attention of the Massilians was now more directed to literature and philosophy, of which indeed they were already diligent cultivators. They had spread through the south of Gaul the knowledge of the Greek written character, which Cæsar found in use among the Helvetii (*De Bell. Gall.*, lib. i., c. 29); and now their city became to the west of Europe what Athens was to the east. The moderate charges and frugal habits of the citizens added to the advantages of the place as a place of study, and the most illustrious of the Roman youth resorted thither. Cicero has recorded in the strongest language the praises of the Massilians (*Orat. pro L. Flacco*, c. 26). Livy has put a high encomium upon them into the mouth of a Rhodian ambassador (lib. xxxvii., 54); and Tacitus (*Agricolæ Vita*, c. 4) has spoken in the same strain. [AGRICOLA.]

For more than three centuries the history of Massilia presents no event of interest. In the troubles which followed the abdication of Diocletian and Maximian, the latter (A.D. 310) attempted to resume the purple at Arles, to the prejudice of the emperor Constantine, his son-in-law; but being baffled in his attempt, fled to Massilia, which he vainly attempted to defend. The city surrendered, or was taken by Constantine, and Maximian became his own executioner.

In the reign of Honorius, Massilia repelled the attempt of the Visigothic king Ataulphus, to take possession (Photii, *Biblioth.*); but it afterwards became the prey of Burgundians, Visigoths, and Franks. It was taken from the Franks by Theodoric the Ostrogoth king of Italy.

Toward the middle of the sixth century Marseille (to which we may now give its modern name), was ceded with the rest of Provence by Vitiges the Ostrogoth to the Franks, in order to secure their alliance against the Eastern emperor Justinian, who had sent Belisarius to conquer Italy. While under the Frankish sceptre the town suffered from the Lombards, who sacked it (A.D. 576), and from the Saracens, who seized it, but were quickly driven from it by the Franks, about the middle of the eighth century. In the division of the empire of Charlemagne among his descendants (A.D. 856), Marseille was included in the kingdom of Provence, under Charles, younger son of the emperor Lothaire; and afterwards it made part of the kingdom of Provence, or Bourgogne Cis-jurane, under Boson (A.D. 879). The union of this kingdom with that of Bourgogne Transjurane under Rodolph II. (A.D. 930), and the subsequent acquisition of the united kingdoms by the emperor Conrad le Salic (A.D. 1032), brought Marseille into the condition of a remote dependency of the German empire. During these changes, from the tenth century Marseille was under the immediate dominion of its own viscounts.

The Marseillois appear to have been actively engaged in the Crusades; and in the third Crusade, several armaments sailed from their port. The commerce of the town at this time was great, and the townsmen were in league with some of the great trading cities of Italy for the purposes of trade or of defence. In the beginning of the thirteenth century they freed themselves from feudal subjection to their viscounts and to the counts of Provence, and organised themselves into a municipal republic, under a chief magistrate called the podestat; but in a few years they were deprived of many of their privileges by Charles of Anjou, count of Provence, brother of Louis IX. It was from Marseille that Charles set sail for the conquest of Naples. The troubles which agitated Provence during the reigns of his successors materially diminished the population of Marseille; and as the authority of the emperor in Provence had ceased to exist even in name, the country was exposed to the inroads of the Brigands, who had risen up during the wars of the English in France and the desolation of that kingdom.

In the contest for the sovereignty of Naples and Provence, between the houses of Anjou and those of Durazzo, and subsequently of Aragon, the Marseillois faithfully adhered to the house of Anjou, and rendered signal services to their cause; but in the year 1421 the town was taken by the king of Aragon, and a considerable part of it sacked and burned. It was, upon the retreat of the Aragonese (A.D. 1423), further plundered by marauders from the surrounding country. The town recovered however from this severe blow, and became the ordinary residence of Réné, duke of Anjou and Lorraine, who died here, A.D. 1480. Upon the death of Charles, count of Maine, successor of Réné, Marseille came directly under the government of the French crown, to which it has ever since remained subject.

In the war of the emperor Charles V. with François I. of France, the Constable Duke of Bourbon [BOURBON, CHARLES DE] at the head of an army of Imperialists besieged Marseille (A.D. 1524), but was bravely repelled by the townsmen. In the year 1536 the town was again unsuccessfully attacked by the Imperialists under Charles V. in person and the Duke of Alba. In the religious troubles of the sixteenth century a plot was formed (A.D. 1585) to betray Marseille into the power of the League, but it failed. Subsequently however the partisans of the League gained a complete ascendancy in the city, which became the prey of intestine commotions, until the Duke of Guise, governor of Provence, for Henri IV., was admitted (A.D. 1596) by the partisans of that monarch. In the reign of Louis XIV. the municipal privileges of the city were diminished, and forts were built, as much probably to control the townsmen as to defend the place. In A.D. 1720, 40,000 or 50,000 of the inhabitants were swept away by pestilence. Belzunce, bishop of Marseille, the echevins or municipal officers of the town, and three physicians of Montpellier, distinguished themselves by their courageous performance of their duties at this trying season. In the Revolution the Marseillois acted a conspicuous part. A band of political fanatics went to Paris, and were among the leaders in the attack on the Tuileries, in August, 1792. The townsmen attempted, but in vain, to support by an insurrection the Girondists against the party of the Mountain.

The city of Marseille is built on the coast of the Mediterranean, which here runs north and south. The harbour is formed by a small inlet of the sea, running eastward into the very heart of the city, which is built round it. Its immediate site is a rich valley or hollow enclosed on the land-side by hills, of which the highest is that of Notre Dame de la Garde, on the south, surmounted by a fort. From the summit of the hill of Viste, on the north side of the town, over which the road from Paris leads, three miles distant, a fine view is obtained of the town and of the numerous country-houses (said to be five or six thousand in number) which occupy the surrounding part of the valley. The town was once fortified, and there are some remains of its walls and bastions. The entrance from Paris is by a fine broad planted road or wide street, which extends into the heart of the town, and is prolonged in a direct line, by a street of less width, quite through the town. To the east of this street is the old town, occupying a triangular point north of the harbour. The other parts constitute the new town, which consists of broad straight streets, provided with paved foot-paths and lined with well-built houses. The port, an oval of more than half a mile long and about a quarter of a mile broad, and capable of containing 1200 vessels, is surrounded by fine quays used as a promenade by the townsmen in the winter. There are several other promenades, the finest of which is that of Tourette, or the Esplanade, on the shore in the old town. The places or squares are more numerous in the old town than in the new, but neither so large, so regular, nor so ornamental. The town-hall built by the architect Puget, faces the harbour; the ground-floor is used as the Exchange; the great council-chamber has some fine paintings. There are a new market-house supported by thirty-two columns of the Tuscan order, a fish-market, and other markets; a lazaretto on the shore, north of the city, one of the finest and best managed in the world. There are also a mint; two theatres, the chief of them one of the finest in France; a triumphal arch, a column, and several public fountains. Water is brought from the little rivers Huveaune and Jarret by an aqueduct almost entirely subterranean; and many houses have wells, the water of which is drinkable.

The population of Marseille in 1789 was 76,222; in 1801, 111,130; in 1811, 102,217; in 1821, 109,483; in 1831, 121,272 for the town, or 145,115 for the whole commune; and in 1836, 146,239 for the commune. It is the third city in France for population, being exceeded only by Paris and Lyon. The city has always depended for its prosperity on commerce. The harbour is very safe. Opposite the mouth of it, which is narrow, not permitting the entry of more than one ship at a time, are the three small islands of If (having a castle, once used as a state prison, and numerous batteries), Ratonneau, and Pomègue, which are both fortified. The entrance to the port is defended by two forts; that of St. Jean on the north, and that of St. Nicholas on the south. Fort St. Nicholas, which was converted by Louis XIV. into a citadel, has been in great part demolished by the townsmen.

The port is not deep, and is liable to be filled by the mud brought down by the rain from the neighbouring hills: machines are continually at work to keep it clear. Frigates cannot enter without difficulty; ships of the line cannot enter at all, but are obliged to anchor in the road between the islands of Ratonneau and Pomègue, where also vessels perform quarantine. This anchorage is secure. The number of vessels which enter the port is estimated at 5000 or 6000 in the year; and the customs and other dues collected are estimated at nearly 1,000,000*l.* annually. The French trade with the Levant is entirely carried on from this port; and there is active communication with Italy, Spain, and Barbary. The imports are of raw cotton, sugar, dye-woods, and of divers articles from the Levant. The exports are of wines, brandy, corn, dried fruits, oil, soap, hosiery, damask and other linens, woollens, silks, leather, hides, and colonial produce. The chief manufactures are those of soap, morocco and other leather, glass, porcelain, hats, caps, starch, gunpowder, snuff, alum, sulphur, vitriol, nitre and other chemicals, glue, wax-candles, straw-hats, and cutlery. The refining of sugar and salt, calico-printing, the distillation of brandy, essences, and liqueurs, cork-cutting, and the preparation of anchovies and other salt provisions, dried fruits, olives, and wine for exportation, are carried on. The city is from its commercial character the resort of foreigners of all nations; and the variety of costume, continual bustle, and medley of languages which this occasions are among the most striking features of the place. The character of the people is by no means favourably drawn by our authorities.

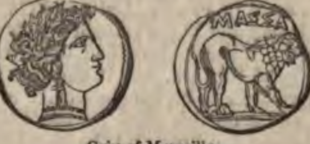
Marseille has communications by daily public conveyances with Lyon, Aix, Avignon, Nîmes, Toulon, Geneva, and other places; and by steam-boats at brief intervals with Nice, Genoa, Leghorn, Bastia, Civita Vecchia, and Naples; and at longer intervals with Port Vendre, Barcelona, and Valencia. It abounds with hotels and has some public baths and handsome cafés. The mistral, a keen, parching, and often tempestuous wind, blights all verdure, and its blasts are interchanged with the scorching rays of an unclouded sun; swarms of gnats infest every corner night and day, and the scorpion is often found in the houses and occasionally even in the beds.

Marseille has a custom-house, a stamp-office, an exchange, and a board of trade; a commercial court, a subordinate justice court, and a tribunal for the regulation of the fisheries and the settlement of disputes respecting them, the members of which, called Prud'hommes, are annually chosen by the fishermen from among themselves; and several other government or other public offices. There is also an arsenal.

The parish and other Catholic churches and chapels are twenty in number; there are a Protestant church and a Jews' synagogue; with several hospitals and other charitable institutions. There are, an academy of sciences, belles-lettres, and art; an agricultural and a medical society; a high-school, schools of medicine, drawing, music, and navigation; a deaf and dumb school; a public library of 60,000 volumes, a picture gallery, a museum, two botanic gardens, and an observatory. Literature is not much cultivated at present: astronomy and navigation are the studies chiefly pursued. Marseille has produced several learned and eminent men. The navigator Pytheas and the poet Petronius Arbiter, in antient times, and the architect Puget, in modern times, are the chief.

Few antiquities have been discovered at Marseille, and there are no remains of antient buildings; some statues, urns, and medals have been dug up.

The diocese of Marseille comprehends the town and its arrondissement. The bishop is a suffragan of the archbishop of Aix. The town is the head-quarters of the 8th military division, which includes the departments of Basses Alpes, Vaucluse, and Bouches du Rhône. The arrondissement comprehends an area of 252 square miles, and comprehends nine cantons, or districts, each under a justice of the peace, and sixteen communes. The population was 178,866 in 1831, and 180,127 in 1836.



Coin of Marseille.

British Museum. Actual size. Silver.

MARSHAL, a term which, in its origin, meant simply a groom or manager of horses; but from the importance of such an employment in a rude warlike nation, the office of marshal became invested with great military authority, which, according to the usage of the times, drew to itself a considerable civil jurisdiction. One of the principal officers of state is the king's marshal, which office is now held hereditarily by the duke of Norfolk, who is said to have the office of marshal of England, and also an honour in respect of which he is earl marshal. This office was executed in time of war in the king's host or army; in time of peace, in the aula regis, or king's great court. Upon the division of the aula regis the marshal appointed deputies in the new courts. In the King's Bench, the marshal's deputy was called the marshal of the marshalsea of the king's court, or marshal of the King's Bench. In the Exchequer, the deputy was marshal of the Exchequer, or clerk of the marshalsea of the Exchequer. The duty of the acting marshal is regularly to attend the court, and to take into his custody all persons committed to his custody by the court.

The lord high constable, when there was one, and the earl marshal, were the judges before whom the court of chivalry or court martial was held. This court had cognizance of contracts touching deeds of arms and of war arising out of the realm, and of all appeals [APPEAL] of offences committed out of the realm, and of matters within the realm relating to war, in cases which the courts of common law were incompetent to decide. Its proceedings were according to the course of the Roman or civil law. The earl marshal cannot hold this court alone, and there has been no hereditary or permanent high constable since the forfeiture of the duke of Buckingham, 'poor Edward Bohun,' in the time of Henry VIII. In the few cases in which the court of chivalry has been since held, a high constable has been appointed for the occasion. In the case of an appeal of death brought in 1583 against Sir Francis Drake by the heir of one Dowtie whose head Drake had struck off in parts beyond sea, Queen Elizabeth refused to appoint a high constable; and thus, says Lord Coke, the appeal slept. The minor duties of the earl marshal are set out with great minuteness of details in a document preserved in Spelman's 'Glossary.'

Besides the earl marshal, there is a knight marshal, or marshal of the king's household. The office of earl marshal, and that of marshal of the King's Bench, as well as that of the knight marshal, is called a marshalsea; but the term is ordinarily applied to the last only.

MARSHALSEA. In the Marshalsea of the king's household there are two courts of record. 1. The original court of the marshalsea is a court of record, to hear and determine causes between the servants of the king's household and others within the verge, that is, within a circle of twelve miles round the king's palace, with a jurisdiction of pleas of trespass where either party is one of the king's servants. 2. The palace court was erected by letters patent, 6 Charles I., confirmed by Charles II., and has authority to try all personal actions between party and party, though neither of them be of the king's household, provided they arise within twelve miles round Whitehall. The judges of this court are, the steward of the king's household and knight-marshal; but the court is, in fact, held before a barrister deputed by the knight-marshal. The palace court is held once a week in Scotland Yard, and causes are here brought to trial in four or five court-days, unless they are of sufficient magnitude or importance to induce either party to remove it into one of the superior courts. A writ of error lies from both courts into the court of king's bench.

MARSHAM, SIR JOHN, born 1602, died 1685. The noble family of Marsham have the honour of tracing themselves to a man whose chief distinction it was, that he was one of the most eminent scholars of his age, as the founder of their hereditary honours. He was one of six sons and four daughters of an alderman of London, and was born in the parish of St. Bartholomew. He had his education in Westminster school, and St. John's College, Oxford. He afterwards travelled much abroad in France, Italy, and Germany, both as a private gentleman and in the suite of Sir Thomas Edmunds the ambassador. When he returned home he betook himself to the study of the law, but it does not appear that he attained to more than to be appointed one of the six clerks in Chancery, and even this office he lost when the contentions arose between the king and the parliament. Nor was this all; for, following the king to Oxford, and remaining attached to the royal cause, he suffered greatly in his estate. On the change of the times he was returned to parliament for the city of Rochester, was restored to his six clerks' office, was knighted, and soon after was created a baronet. He died at Bushy Hall near Watford.

Such is the outline of his life. The predominance of a political power to whom he was obnoxious, in the period of his life when his mind was at maturity, gave him leisure to pursue those studies for which he had acquired a taste in the earlier period of his life. The subject on which his mind was particularly directed is one of peculiar intricacy and difficulty, the disentangling the perplexed statements to be found in early writers concerning antient dynasties and events in the earliest periods of history. The results of these studies he gave to the world in a folio volume, printed at London in 1672, which he entitled 'Canon Chronicus, Ægyptiacus, Ebraicus, Græcus,' being an enlargement of a work on the same subject published in 1649, entitled by him 'Diatribe Chronologica.' Sir John Marsham has treated the subject in a manner befitting a scholar intent on nothing but the discovery of truth, if truth be attainable. His work was published at Leipzig in 1676, and at Franeker in 1696, with a preface by the editor Menckenins, in which some of his conclusions are questioned. It is probable that the modern discoveries in Egypt may affect in some points the argument of this learned scholar.

In the same spirit he attacked the difficulties which rest on the 'Chronology of the Early History of Persia:' but this work has not, we believe, been given to the public; nor the 'Dissertations on the Money of the Antients,' and on the 'Roman Provinces and Legions,' which it is understood he left in manuscript.

There is another work of his, less celebrated, the Preface, or Προπυλαιον, as he called it, to the great work on English monasteries, entitled 'Monasticon Anglicanum,' which was begun by Roger Dodsworth, and finished by Sir William Dugdale. This appeared in 1655.

Sir John Marsham was not only himself learned, but his two sons, Sir John Marsham of Cuxton, and Sir Robert Marsham of Bushy, were also studious and learned men. The son of Sir Robert was created Lord Romney by King George I.

MARSHES are those places of greater or less extent on the earth's surface, where the soil is almost constantly soaked with water. The swamp, the bog, the fen, and the morass, are so many different names for the same thing, or modifications which have not yet been defined. Whether marshes be considered with regard to their advantages or disadvantages, they are equally interesting, and are objects that call for the attention of individuals and sometimes of states. The advantages which they offer are of limited extent, and may be divided into spontaneous and artificial. The former consist in the natural productions which are furnished by some of them, of which peat is unquestionably the most important. (Ireland, Holland.) Some furnish iron-ore in considerable quantity, and, though generally of a bad kind, it is sometimes very good, and worked with advantage (Siberia); others supply aquatic game in abundance, which is a great resource to the neighbouring inhabitants, either for consumption or as an article of commerce (the marshes of Tuscany); others again abound in eels and other fish; and some, as those of the Saône in France, and those of Poland, are valuable for the myriads of leeches which they furnish, and which are sent to distant parts. The soil itself, dug up from the marshes, which is called bog-earth, and the upper surface of the peat bogs, burnt or unburnt, are in many cases considered an excellent manure, and employed as such. (Poland, France.) The reeds, rushes, willows, &c., which grow so abundantly in certain marshy lands, are in many places objects of considerable importance. (Italy, Holland.) The artificial advantages to which marshes may be turned are confined chiefly to the cultivation of rice, where climate and other circumstances are favourable to the growth of this grain. (North America, Hungary.) The disadvantages of marshes are great: they are in general fatal to health, and agriculture suffers by the loss of all the marshy land. That health is materially injured by the pestilential air of marshes is evident from the fact that the ordinary mean length of life in their neighbourhood is very low. Cattle are also great sufferers from the influence of marshy grounds. The engineer Rauch says, 'Marshes are the ulcers of the earth, which blur the fair face of nature, where all should be beauty; and from these infectious sores the languor of death extends far and wide over all that should live and flourish:' but the details of their baleful influence are nowhere more strikingly set forth than in the prize essay on this subject, by M. Ramel of Paris. Nevertheless all marshes are not equally prejudicial to health; but independent of their different degrees of insalubrity, marshes present other distinguishing features. The climate, the nature of the soil, and the vegetation, are all so many circumstances which vary the appearance and character of marshes. The quantity of water is also very different; in some cases it is hardly visible, while in others, at least in certain seasons, the marsh presents the aspect of a multitude of stagnant pools covered with aquatic birds. This is the case with many of the Tuscan marshes, which are moreover remarkable for their floating islands, which sometimes unite and cover a large surface: these islands have little solidity, and, eventually sinking, become in time converted into peat: some of these marshes gain in extent, while the soil of others gradually rises, and the marsh disappears. Reeds are particularly abundant in the Tuscan marshes, and they are applied to a great number of useful purposes. The quality of the marsh-water also differs: thus, in some of the marshes of South Carolina, in the United States, it is salt, as likewise at Rochelle, Rochfort, &c., in France. In other places it is salphurous, as is the case with the marshes of Mesopotamia; in many it is ferruginous, as in Siberia, where the marshes are strongly impregnated with sulphate of iron from the vitriolic springs which flow into them. The trees which are found imbedded in these marshes are so thoroughly impregnated with oxide of iron, that they supply an ore of excellent quality, furnishing a metal free from the defect of brittleness so common to the iron of most other bog-ores. In some cases the water of the marsh exhales an intolerable smell of sulphuretted hydrogen, arising from the decomposition of the sulphate of magnesia or Epsom salt, which is continually forming on their banks. (Siberia, and the banks of the Euphrates.)

In cold countries marshes freeze, but seldom become dry; in warm countries, on the contrary, the marshes are often dry, and such can never form peat. As to the vegetation of marshes, it is either composed of reeds, rushes, algæ, gramineæ, or mosses, of which the *sphagnum palustre* is the most common in peat-bogs. Brushwood of various kinds, and willows and alders, are also common in marshy grounds.

Marshes are found in all kinds of situations, in continents and in islands (Iceland, Anau, &c.), on the margin of the sea, as well as in the interior of the land, on the slopes and even on the summits of mountains, as well as in the plains. Most countries have them in greater or less abundance, but it has been remarked that they are less common in Asia and in Africa (as far as the latter is known) than in Europe, and that they are more abundant in America than elsewhere. In this latter part of the world almost all the plains are wet and abound in marshes; they are exceedingly common in the northern countries of the globe, particularly in the flat parts bordering on the sea, where the land is low and the subsoil clay. Here the rain and snow-water accumulate, and remain for want of sufficient evaporation to carry them off.

It would be impossible to enumerate all the existing marshes: we may however observe that in Italy there are the Tuscan and the celebrated Pontine marshes, which are of great extent; in France there are about 1,500,000 arpens, or French acres, of marshes, some of great surface, as that of Montoire near the mouth of the Loire, which has been worked for its peat for upwards of five hundred years, and gives constant employment to 8000 persons. Ireland contains about 3,000,000 acres of marsh; the marsh or bog of Allen alone contains 300,000 acres, and there are others very extensive. England has many marshes, particularly in Lincolnshire, Somersetshire, Kent, and Cambridgeshire; Chester, Huntingdonshire, Lancashire, and Stafford have extensive marshes, some of which contain embedded trees. Scotland is much diversified with marshy ground, as in Peeblesshire, Ayrshire, Sterlingshire, Kinross, &c. As for Holland, the whole country is properly a drained marsh, and it still contains some extensive bogs which furnish peat. All the space along the coast from Holland to Denmark is little better than a succession of marsh and sand. Russia in Europe has marshes of vast extent, as those at the source of the Don, along the river Pripitz, and round the sea of Azoff, as also in Finland and the Baltic Provinces, in Lithuania and Poland. The eastern part of Prussia abounds in swamps. Norway and Sweden have some bogs, but little in proportion to their territory. In Bessarabia in Turkey, and all along the lower Danube, there are extensive marshes covered with reeds. In Hungary the marshes are estimated at 2,000,000 arpens. Switzerland has some considerable swampy patches, many of which are on the slopes of the mountains and in the higher valleys. In Spain and Portugal there are some extensive marshes; indeed they are more or less scattered all over Europe.

Asia has its marshes and swamps, but they are less common than in Europe, if we except the northern portion, where they are in great number and very extensive, as between the lower Ob and the Yeniseï, and between this last river and the Lena. There is between the little Tanguska and the Yeniseï the marsh called Lis, equal in extent to the great lake Ladoga, suspended as it were in the midst of rocky hills. The province of Okhotsk has many swampy forests. A large part of China is naturally swampy, but it is to a great extent drained by the numerous canals which intersect the country. Tonquin has many marshes, and the peninsula of Malacca contains many of great extent. In India the province of Oude has some extensive marshes covered with reeds, the retreat of great herds of wild buffaloes. The mouths of the greater part of the rivers of India are marshy, and large swamps are sometimes found along their course, as is the case with the Padder. In the northern provinces there are many savannahs, or wet meadows. There are swamps along the Euphrates, and those of Mesopotamia are bitter, sulphurous, and salt. In Persia the province of Ghilan, in other respects fertile and beautiful, is very unwholesome on account of its marshes and marshy forests. Mazenderan has also many swamps. The eastern side of the lake Aral is marshy. The steppes of the Kirghis abound in salt marshes and pools. The Asiatic islands, that is, all those that are of any extent, contain marshes: thus part of the coast of Sumatra is covered with extensive marshes, which have caused it to receive the name of 'the pestiferous coast;' the reeds are gigantic bamboos, and a continual fog hangs over the aquatic soil. Batavia, Samarang, and other places in the island of Java are reputed to be so unwholesome, in consequence of the stagnant waters and pestilential marshes, that the island has been named the grave of Europeans. The Philippine Islands have a great many peat bogs. New Holland has much marshy ground along the coast, and immense swamps have been seen inland.

As for Africa, its interior is too little known to enable us to speak with any certainty of its marshes; but the southern part, according to Barrow, has many and extensive swamps covered with reeds and saline plants. Some of the rivers on the east are marshy at their embouchures, which is also the case with the Quorra. Madagascar contains marshes, in which the singular Ravenala (*urania speciosa*), a kind of palm, grows, remarkable for the size and disposition of its leaves, which are similar to those of the banana, and are employed by the natives as table-cloths, napkins, plates, dishes, and spoons.

America contains immense marshes. In the frigid zone of the New World, as far as known, fog-enveloped marshes have been found. To the westward, in Russian America, the land lying between the coast and the mountains is a slip of black swampy soil; some of the marshy grounds are on the slopes of the mountains, and retain the water like a sponge; their verdure (being covered with moss of various kinds) gives them the appearance of firm land, but in endeavouring to pass them the traveller sinks up to the waist. On the opposite or east coast of America we find Newfoundland intersected by marshes and morasses. Lower Canada has neither marshes nor stagnant water, but the rivers are muddy. To the south of the great lakes of North America, and as far south as Mexico, the United States contain a great number of marshes, and some of them of great extent. The low lands of Mexico also contain many swamps The former intendencia of Vera Cruz is principally occupied with marshes and sands. South America contains a great abundance of extensive marshes, as on the upper Apure, an affluent of the Orinoco; and the delta of the latter river is one vast swamp. The region which extends between the Andes and the Pacific has little marshy ground, if we except Chaco, where there are many swampy valleys; but on the other hand the immense plains which occupy the whole interior of the continent, from the mountains of Caracas on the north to the Straits of Magalhaens on the south, contain a great number of extensive marshes. All the immense basin of the Amazon is covered with swamps and wet land and marshy forests. To the south of the Campos Parexis, the provinces of Moxos and Chiquitos contain extensive marshes; in the latter particularly there is the great lake or marsh of Xarayes. [BRAZIL, p. 356.] This marsh is temporary however, being dry a great part of the year, and then covered with the corn-flag (*gladiolus*) and other *irideæ*. The province of Chaco is also full of marshes, as well as that of Cordova, in which are the swamp of Los Porongos, the Mar-chiquito, &c. In La Plata there is the great marsh of Ybera, formed by the infiltrations of the Parana. At the north-west extremity of the Pampa of Buenos Ayres is the great reedy marsh called Los Canaverales, and along the whole course of the Rio Mendoza, and between that river and the foot of the Cordilleras, there are extensive marshes. They also exist on the upper part of Rio Negro. In short, we may say that all the immense region of the Pampas. or plains of South America, contains marshes. Brazil h
swampy woods; and in ascending the coast we
great island of Marajo at the embouchure of the
a considerable tract of which is a marsh, formed

the deposit from the water of the river, and in part by the sands of the sea. Farther north again the whole coast of French Guyana is a swamp.

This enumeration of the known marshes and swamps, though comprehensive, is however far from being complete. Very large portions of the earth's surface remain still unexplored, and physical geography is yet too modern a science to have attracted the attention of travellers to the correction and completion of its details. Nevertheless it is certain that the extent of marshy ground is very great; and probably it was formerly much greater, for a multitude of natural circumstances have greatly diminished them, and are still effacing them by degrees. On the other hand colonization, and the consequent increase of population in the newly settled places, cause the clearing of forests and the draining of marshes to go on rapidly. There is no doubt but that in proportion as the swamps are dried up the source of many diseases will be got rid of; but again, it may be doubtful whether the increased drought occasioned by so vast a reduction of evaporating surface may not engender other diseases equally fatal with those which now spring from the superabundance of swampy ground; and it is possible that even absolute sterility may result, in some cases, from imprudent drainage.

MARSIAN WAR. [Social War.]

MARSIGLI, LUIGI FERDINANDO, COUNT, born at Bologna, of a noble family, in 1658, studied mathematics under Borelli, and natural history under Malpighi and other able professors. At the age of twenty he went to Constantinople. On his return he published 'Osservazioni sul Bosforo Tracio' (Rome, 1681), which he dedicated to Christina of Sweden; and he also wrote a memoir on the rise and decline of the Ottoman empire, which was not published until after his death. He afterwards served in Hungary as a volunteer in the Imperial army against the Turks, was raised to the rank of captain, and was wounded and taken prisoner at the battle of Raab, in 1683. He was sold as a slave, and, after suffering considerable hardships, was ransomed by his family. He was then employed by the emperor Leopold I. as an engineer, to settle the boundary-line of the Austrian dominions on the side of Turkey, agreeably to the treaty of peace between the two empires. When the war of the Spanish succession broke out, Marsigli, who was already a general, was actively employed, and he found himself in command of the garrison of Brisach, of which town the Count d'Arco was political governor. Brisach surrendered to the French thirteen days after they had opened the trenches. The aulic council of Vienna highly disapproved of the surrender, and Marsigli was publicly sentenced to be cashiered. He tried every means to have the sentence revoked, but in vain. He wrote and published a memoir in his defence, which is said to have appeared perfectly satisfactory to competent judges, and among others to Marshal Vauban. From that time he devoted himself to study; he travelled in France, was numbered among the members of the Academy of Sciences of Paris, and at last returned to his native town Bologna, to which in 1712 he made a donation of his scientific collections, which were placed by the senate of Bologna in a building allotted for the purpose, and called the Institute of Sciences and Arts. In 1726 Marsigli published his great work on the Danube, 'Danubius Pannonico-Mysicus, Observationibus Geographicis, Astronomicis, Hydrographicis, Historicis, Physicis, perlustratus ab Aloysio Ferdinando Comite Marsili, socio R. Societatum Parisiensis, Londinensis,' etc. (Amsterdam, 7 vols. folio, with handsome plates). The first volume treats of the geography of Hungary, Servia, and other countries bordering on the central Danube; the second, of the antient monuments in the same; the third, of the geology; the fourth, fifth, and sixth, of the ichthyology, zoology, and ornithology; and the last contains a catalogue of the plants, and treats of the nature and properties of the waters of the Danube and its great affluent the Theiss.

MARSTON, JOHN, a dramatist in the reigns of Elizabeth and James I., the particulars of whose life, and even the exact times of whose birth and death, are, like those of many of his contemporary poets, very uncertain. On the testimony of Wood, he seems to have been a student at Corpus Christi College, Oxford. At one time he appears to have been intimate with Ben Jonson, if we may judge from his dedication to that poet of the 'Malecontent;' but from the epistle to the reader prefixed to his 'Sophonisba,' it seems that his friendship subsequently ceased, as that epistle contains severe strictures on Jonson for his use of passages from classical authors in his tragedies of 'Sejanus' and 'Catiline.'

Marston left several plays, of which the following have been printed separately:—'Antonio and Mellido,' 'Antonio's Revenge,' 'Dutch Courtezan,' 'Insatiate Countess,' 'Malecontent,' 'Parasitaster,' 'Sophonisba,' 'Tamerlane the Great,' and 'What you will.' Of these the 'Malecontent,' an excellent play, abounding in causticity, and embellished with the most forcible poetic expressions, is printed in Dodsley's Collection. It appears however from the title-page of the first edition (1604) that this piece was written by Webster, and only altered by Marston. He also left some miscellaneous poetical works, collected and edited by Mr. Bowle in 1764; and he assisted Ben Jonson and Chapman in the composition of 'Eastward Hoe,' a play which is in Dodsley's Collection.

MARSTRAND. [Sweden.]

MARSUPIA'LIA, or MARSUPIA'TA (*Marsupium*, a purse or bag), an extensive group of Mammalia, differing essentially from all the others in their organization, and comprehending genera fed by every variety of nourishment. Their structure is, as a necessary consequence, modified accordingly; and we find among them an adaptation of the organs of progression, prehension, and digestion to their several wants and habits, so that we may trace in them analogies to the carnivorous, insectivorous, herbivorous, and rodent forms of the other mammiferous quadrupeds.

The first species belonging to this anormal or aberrant group brought under the notice of zoologists were those of America, and they received from Scaliger the appropriate name of *Animalia crumenata*, or *Purse-bearing animals;* for the leading peculiarity in these Marsupials is, so to speak, the premature birth of their young, which are born in a state of development not much beyond that of the fœtus in the other groups, at a very early stage of pregnancy, and attach themselves by the mouth to the teats, which are situated in the marsupium, or pouch, of the mother; and in this nidus, or, as it may be termed, second uterus, the almost embryotic young one is nourished till the little knobs that marked the place of the extremities shoot out into limbs, and till the whole frame-work of the animal is completed, and it is able to go alone. Long after this period it flies to the pouch upon the approach of danger, or enters it when fatigued, and may often be seen peeping out to ascertain whether it is safe to venture abroad again.

Linnæus, who appears only to have known the American species, or Opossums, arranges them under the generic appellation of *Didelphis*,* in his order *Feræ*, placing them between the Bears, Badgers, and Racoons, &c. (*Ursus*), and the Moles (*Talpa*).

Cuvier, who had the advantage of knowing the great quantity of species and variety of forms discovered in New Holland, arranged the copious materials which that extraordinary country afforded in addition to the few American forms, as the fourth order of his *Mammifères*, dividing the new numerous group into several subdivisions, and placing the order between his *Carnassiers* and his *Rodentia*.

Illiger makes the *Marsupialia* the sixth family of his second order, *Pollicata;* and his third order, *Salientia*, consists of the Kangaroos and Potoroos.

M. de Blainville divides the *Mammifères* into two subclasses; the first being the *Monadelphes*, and the second the *Didelphes*, which last consists of the *Marsupialia* and *Monotremes*, properly so called: we say properly so called, because, strictly speaking, every Marsupial female is a *Monotreme*.

Mr. Gray collects all the forms under the family *Didelphidæ*. The subfamilies into which the group is separated by him will be found in the article Mammalogy, where the views of zoologists in general, as to the classification of these animals, will be found.

Storr congregates all mammalia with opposable thumbs into one great group, which he divides into three sections: the first consisting of the genus *Homo;* the second of the genera *Simia*, *Prosimia*, *Procebus*, *Tarsius*, and *Lemur;* and the third of the genera *Didelphis* and *Phalanger*.

Mr. Ogilby separates his *Cheiropeds* (Mammals with opposable thumbs) into the three groups, *Bimana*, *Quadrumana*, and *Pedimana*, which last are characterised as hav-

* Or more properly 'Didelphys,' signifying 'double uterus.

ing opposable thumbs on the hind hands only. The *Pedimana* consist of the families *Simiadæ* (with anthropoid teeth) and the *Didelphidæ* (with abnormal teeth). These last consist of the genera *Phascolarctos*, *Phalangista*, *Petaurus*, *Didelphys*, *Cheironectes*, *Dasyurus*, and *Phascogale*. ('Nat. Hist. of Monkeys, Opossums, and Lemurs,' *Menageries*, vol. iii., 1838.)

Before we proceed to notice the classification proposed by Professor Owen, it will be advisable to draw the attention of our readers to the Marsupial

ORGANISATION.

Skeleton.—The Marsupialia differ considerably from each other in the osseous part of their structure, as might be expected in a group whose food and habits vary so much. Our limits do not permit of a detailed inquiry into these differences; but the examples given in the skeletons, skulls, and teeth represented in this article will convey a general notion of the formation of the bony parts, and the modifications to which they are subject. There is however one peculiarity common to all, which is even found in the true *Monotremes*, and presents a marked discrepancy from the osseous systems of the other Mammalia;—we allude to the *Marsupial bones.* These are attached to the pubis, and embedded in the muscles of the abdomen, where they afford support to the marsupium, or pouch, in the females. They exist also in the males, to whom their presence seems to be necessary for the purposes of reproduction. These bones and their situation are shown in the skeletons of the Kangaroo and Opossum. The principal modifications in the general form of the skull and in the other parts of the skeleton are well pointed out by Professor Owen, in his paper 'On the Osteology of the Marsupialia.' (*Zool. Proc.*, Oct., 1838.)

Organs of Digestion.—These, as might also be expected, vary greatly. The teeth are appropriated to the food or prey to be taken, whether it be flesh, insects, fruits, herbs, or roots; and in conformity with the same law, we have a simple or a complex stomach, and a corresponding structure in the viscera; the flesh-eating tribes being entirely without a cæcum, and the others possessing that appendage in a greater or less degree according to circumstances.

Organs of Reproduction.—But it is in the organs of generation and mode of reproduction that the great and striking difference exists between the Marsupials and all other known Mammals. Tyson first distinguished the true *vaginæ* from the *urethro-sexual canal*, as it has been termed by later physiologists, though he denominated it the *common passage* or *canalis;* nor was his conjecture as to the parts of the complicated uterine apparatus wherein gestation is carried on other than true. John Hunter, Sir Everard Home, M. Geoffroy St. Hilaire, M. de Blainville, and Mr. Morgan have all thrown more or less light upon this obscure subject; and the paper of Mr. Morgan, in the 'Transactions of the Linnean Society,' vol. xvi., is especially worthy of attention, as far as it goes. But it was reserved for Professor Owen to supply the many and great deficiencies which existed, and to attain a precise knowledge of the mode in which the embryo is developed, by determining from the examination of the impregnated uterus the nature of the relations subsisting between the fœtus and the mother.

Professor Owen, in his paper 'On the Generation of the Marsupial Animals, with a Description of the Impregnated Uterus of the Kangaroo' (*Phil. Trans.*, 1834), observes that in all the genera of this group the uterus is double, and the true vagina is separated either wholly or for a considerable extent into two lateral canals. Both the digestive and generative tubes terminate within a common cloacal outlet, and the term *Monotremata* therefore, he remarks, though confined to the edentate *Marsupiata*, is so far applicable to the whole of this aberrant division. As the females approach the *Oviparous Vertebrata* in their separate genital tubes, so also the males resemble them in the peculiar structure and connexions of the intromittent organ; and he points out that in the *Macropi*, the *Dasyuri*, and the *Phalangistæ* the corpora cavernosa penis have the same position below the pubis, with the same want of ligamentous attachment to the bony pelvis; and the glans has the same bifurcated form and double groove for the transmission of the semen as in the Opossum, in which these peculiarities in the male organs were first described by Cowper (*Phil. Trans.*, 1704).. 'In those genera,' continues Mr. Owen, 'in which the females have an inward fold of integument, or abdominal pouch, the males have an outward duplicature in the corresponding situation for the lodgment of the testes, which are thus placed anterior to the penis; and it is a remarkable fact that the muscle which surrounds the mammary gland in the one sex is analogous to the suspensory cremaster of the testes in the other. Both sexes in the Marsupial genera manifest also their affinity to the oviparous classes in possessing two superior venæ cavæ, and in the want of the inferior mesenteric artery; and the marsupial bones, so common in the skeletons of reptiles, are limited in the mammiferous class to this division, in which alone, from the peculiarly brief period of uterine gestation, and the consequent non-enlargement of the abdomen, their presence might be expected. But these bones serve important purposes in relation to the generative economy of the *Marsupiata.* In the female they assist in producing a compression of the mammary gland necessary for the alimentation of a peculiarly feeble offspring, and they defend the abdominal viscera from the pressure of the young as these increase in size during their mammary or marsupial existence, and still more when they return to the pouch for temporary shelter. In the males, with the exception of the edentate genera, the marsupial bones, from their relation to the cremaster muscles, which wind round them like pulleys, assist in the compression and retraction of the testes during coition; a process which, from the peculiar position of the scrotum, has been supposed to differ from that of other quadrupeds. A recent opportunity however of observing the coitus of the Kangaroo, at the Zoological Gardens, proves that there is no difference as to position, which is the same as in the Dog, but that it is chiefly remarkable for the repetition of the act during a long-continued embrace. The peculiar length and tortuosity of the double vagina, for which the bifurcated glans of the male organ is adapted, may render necessary so efficient a process; and as the testes are then retracted entirely out of sight, it would seem that the marsupial bones have the same relation in the male to their secretion as they have in the female to the mammary glands. The minute size of the young of the American Opossum when found in the marsupium, their pendulous attachment to the nipples, and perhaps the mode in which the latter are developed, gave rise among the earlier observers to a supposition that they were originally formed from those parts; and the gemmiparous theory, which has subsequently often been revived, appears to have been prevalent at the time when Tyson first devoted his attention to the subject.'

Professor Owen, after concluding, from data stated in his paper, that it may be concluded that the ovulum in the Kangaroo quits the ovisac in a condition corresponding to that in the ordinary *Mammalia*, and increases in a similar manner as it descends in the uterus, goes on to describe in minute and most interesting detail the fœtus and membranes of a Kangaroo (*Macropus major*) at apparently the middle period of gestation, which in that animal continues for thirty-eight days. The membranes consisted of an amnios, a very large vitelline sac, rendered highly vascular by ramifications of omphalo-mesenteric vessels, and a thin unvascular chorion. There was no placenta, nor any adhesion between the exterior membrane of the fœtus and the internal surface of the mother by the opposition and interlacement of villi, or vessels, as in those *Mammalia* in which the placenta is replaced by a uniform villous and vascular chorion; the condition of the fœtus was such as occurs in the viper and other ovoviviparous reptiles, except that there was no trace of the existence of an allantois in that stage of the fœtal development. The dissection of very young mammary fœtuses of the Kangaroo, Phalangista, and Petaurus exhibited the remains of a urachus and umbilical vessels, whence Professor Owen concluded that at a more advanced stage of the fœtus an allantois was developed. Mr. Owen remarked that as the growth of the fœtus advanced, the circulating fluids became necessarily more charged with decomposed particles of the organised substance; and that although the extended surface of minutely subdivided blood-vessels afforded by the vitelline sac might serve both for respiration and nutrition at the earliest stages, yet that at a late period, and as the embryo acquired additional bulk and strength and parts, an accessory apparatus for that end appeared to be necessary. In all the *Reptilia*, he observed, in which the respiratory function of the fœtus is not performed by the extension of vascular filaments from the sides of the neck, an allantois or cæcal process, organised by umbilical or hypogastric vessels, is produced from the terminal portion of the intestinal tube. In the placental *Mammalia*, where the vitelline sac and vitellus are relatively smaller, the allantois makes its appearance much earlier, but is developed in different proportions in the different orders. It is subservient in all the placental *Mammalia* to the important function of the transference of the hypogastric or umbilical arteries to the exterior enveloping membrane or chorion; and in these *Mammalia*, Mr. Owen further remarked, the umbilical vessels coextended with the allantoic cæcum seek a more intimate contact with the vascular surface of the womb, and proceed to organise the chorion shooting out into villi, either extended over the whole surface, as in the mare, or disposed in circumscribed tufts, as in the *Ruminants*, or limited to one place and forming a single placenta, as in the human subject, and in all unguiculate mammals.

As connected with this subject Mr. Owen subsequently exhibited a preparation (of which a cut is given in Loudon's 'Magazine of Natural History,'[*] with the summary of the professor's paper in the *Phil. Trans.*) to the Zoological Society of London, and took occasion to observe that in the bird and reptile the umbilical vessels are limited to the allantois, and do not extend beyond that membrane to the chorion; the allantois therefore plays a primary part in the respiration of the fœtus. In the placental mammalia, on the other hand, its office as a temporary respiratory organ is secondary, but it is essential as a means of transference of the umbilical vessels to the chorion; it has therefore a pre-existence to the placenta, and without it the placenta could not be formed; for if it be considered that the embryo is formed within the bag of the chorion, and is originally free from any connexion with that membrane, there must of necessity be some support for the umbilical vessels during their passage to the chorion; but no other is known except the allantois, or urinary bladder, and urachus, as its remains are termed. The existence of a placenta, in Mr. Owen's mind, therefore infers the pre-existence of an allantois, but the reverse of the proposition does not therefore hold good. In birds and scaled reptiles the allantois itself performs the functions of the placenta or vascular chorion; and the question to be resolved relatively to the Kangaroo and other Marsupials was whether, the allantois being developed, it would serve as a medium for the organization of the chorion, or remain, as in the oviparous vertebrata, an independent vascular bag or cæcum. The examination of the preparation alluded to, a uterine fœtus of a Kangaroo placed at Mr. Owen's disposal by Dr. Sweatman, contributed to the solution of that question. This fœtus was further advanced than that described by Mr. Owen in *Phil. Trans.* The digits of the hinder extremities were, in this, completely formed. The umbilical chord extended nearly three lines from the abdominal surface of the fœtus; the amnios was reflected from this point to form the usual immediately investing tunic of the fœtus; and beyond the point of reflection, the chord divided into a very large superior vascular sac, organised by the omphalo-mesenteric vessels, corresponding in all respects with the vitelline sac described and figured in Mr. Owen's paper in *Phil. Trans.*; but below the neck of this sac there extended a second pyriform sac, about one-sixth the size of the vitelline sac, having numerous ramifications of the umbilical vessels, and constituting a true allantois. This sac was suspended freely from the end of the umbilical chord; it had no connexion at any part of its circumference with the chorion, and was equally free from attachment to the parietes of the uterus, in which the fœtus was developed.

The period of gestation (thirty-nine days) was determined in 1833, in the vivarium of the Zoological Society of London, by Mr. Owen, whose account of this hitherto obscure and most interesting portion of the natural history of the animal we here give from his paper in the *Phil. Trans.*

'In order to inure the female to the examinations of the pouch when they should become indispensable, they were commenced six days after the copulation, which took place on the 27th of August, and were repeated every morning and evening until the 5th of October, when, at 7 A.M., the fœtus was discovered in the pouch attached to the left superior nipple. On the preceding day at the same hour a great quantity of the moist brown secretion peculiar to the pouch was noticed, indicating a commencing determination of blood to that part, and at different periods during the day the female was observed to put her head into the pouch and lick off the secretion. When she was again examined, at six o'clock in the evening, a slight increase of the secretion was the only perceptible change in the state of the pouch; but there was no appearance in the nipples indicative of the event so soon about to take place. The nipple in use by the young one of the previous year was the right superior or anterior one; it was nearly two inches in length, and one-third of an inch in diameter, while the other three were about half an inch in length, and about a line in diameter. I took notes of the appearance of the marsupium on the 6th, the 10th, 15th, 21st, 30th, and 38th days of uterine gestation; no material alteration was however observable till after the death of the young Kangaroo of the previous year, which took place on the twenty-fifth day, when the brown secretion first began to appear, and the nipple that had been in use to diminish. As parturition took place in the night, the mode of transmission to the pouch was not observed. No blood or albuminous discharge could be detected on the litter, nor any trace of it on the fur between the vagina and orifice of the pouch; but these might have been removed by the mother. The appearances presented by the little one thus detected within twelve hours after being deposited in the pouch were as follow:—It resembled an earth-worm in the colour and semitransparency of its integument, adhered firmly to the point of the nipple, breathed strongly but slowly, and moved its fore-legs when disturbed. Its body was bent upon the abdomen, its short tail tucked in between the hind-legs, which were one-third shorter than the fore-legs, but with the three divisions of the toes now distinct. The whole length from the nose to the end of the tail, when stretched out, did not exceed one inch and two lines. On the 9th of October I again examined the pouch; the young one was evidently grown and respired vigorously. I determined to detach it from the nipple for the following reasons:—1st, to decide the nature of the connection between the fœtus and the nipple; 2nd, to ascertain, if possible the nature of the mammary secretion at this period; 3rd, to try whether so small a fœtus would manifest the powers of a voluntary agent in regaining the nipple; and lastly, to observe the actions of the mother to effect the same purpose, which one might presume would be instinctively analogous to those by means of which the fœtus was originally applied to the nipple. With respect to the first point, I was aware that the Hunterian dissections, as exhibited in the preparations in the museum of the college, and the observations of Mr. Morgan and Mr. Collie, concurred in disproving the theory of a vascular mode of connection between the mammary fœtus and the nipple; nevertheless as a discharge of blood had been stated by Geoffroy St. Hilaire to accompany marsupial birth, or the spontaneous detachment of the fœtus from the nipple, and even the anastomoses and distribution of the continuous vessels in the neck of the fœtus had been speculated on by him, it became desirable to have ocular demonstration of the facts.

The fœtus retained a firm hold of the nipple; when it was detached, a minute drop of whitish fluid, a serous milk, appeared on the point of the nipple. About half a line of the extremity of the nipple had entered the mouth, which extremity was of smaller diameter than the rest of the nipple, not being as yet so compressed by the contracted orifice of the mouth as to form a clavate extremity, such as it afterwards presents. The young one moved its extremities vigorously after being detached, but did not make any apparent effort to apply its legs to the integument of the mother, so as to creep along, but seemed, in regard to progressive motion, to be perfectly helpless. It was deposited at the bottom of the pouch, and the mother was liberated and carefully watched for an hour. She immediately showed symptoms of uneasiness, stooping down to lick the orifice of the vagina, and scratching the exterior of the pouch. At length she grasped the sides of the orifice of the pouch with her fore-paws, and drawing them apart, as in the act of opening a bag, she thrust her head into the cavity as far as the eyes, and could be seen moving it about in different directions. During this act she rested on the tripod formed by the tarsi and tail. She never meddled with the pouch while in the recumbent posture; but when stimulated by uneasy sensations, she immediately rose and repeated the process of drawing open the bag and inserting her muzzle, sometimes keeping it there for half a minute at a time. I never observed that she put her fore-legs into the pouch;

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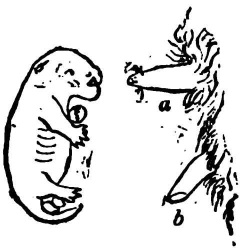
[*] Vol. i., New Series.

they were invariably employed to widen the orifice. When she withdrew her head, she generally concluded by licking the orifice of the pouch, and swallowing the secretion. After repeating the above act about a dozen times, she lay down, and seemed to be at ease.



Outline of the Kangaroo about twelve hours after uterine birth, showing its natural size and external development at this period. The elongation of the jaws has reduced the mouth to a simple round anterior orifice, which subsequently becomes even more contracted before the lateral fissures begin to extend backwards. The eye is concealed by the completely formed eyelids. Three divisions are now seen at the posterior extremity. A longitudinal line indicates the separation of the umbilical pedicle. *a*, the upper nipple of the left side, to which the above fœtus was attached; *b*, the lower nipple of the same side.

The freedom with which the mother reached with her mouth the orifices both of the genital passage and pouch suggested at once a means adequate to the removal of the young from the one to the other; while at the same time her employment of the fore-paws indicated that their assistance in the transmission of the fœtus need not extend beyond the keeping open the entrance of the pouch while the fœtus was being introduced by the mouth, when it is thus probably conducted to, and held over, a nipple, until the mother feels that it has grasped the sensitive extremity of the part from which it is to derive its sustenance. This mode of transmission is consistent with analogy, the mouth being always employed by the ordinary quadrupeds, as dogs, cats, and mice, for the purpose of removing their helpless offspring. It accords also with the phenomena better than those which have been previously proposed; for it is now ascertained, by repeated dissections both of the Kangaroo and Opossum, that there is no internal passage from the uterus to the marsupium; and if the genital outlet can be brought into contact with the orifice of the pouch in the dead Kangaroo by means of great stretching of the relaxed parts, yet such an action has never been witnessed in the living animal;* the tender embryo would be more liable to receive injury from the fore-paws; and these, from the absence of a thumb, could not so effectually ensure its passage as the lips, which can be opposed to each other. Lastly, the young one did not by any of its actions encourage the idea of its possessing the power of instinctively creeping up to the nipple. When the female had rested quiet for about half an hour, we again examined her, and found the young one not at the bottom of the pouch, but within two inches of the nipple; it was breathing strongly, and moving its extremities irregularly as before. I made an attempt to replace it on the nipple, but without success, and the mother was then released. On an examination two days afterwards the marsupium was found empty. Every portion of the litter was carefully searched, in the hopes of finding the fœtus, but without success. The mother therefore, owing to the disturbance of the young one, had probably destroyed it. This was a result I had not expected, for the head keeper at the Zoological Farm had twice taken a mammary fœtus from the nipple and pouch of the mother, soon after it had been deposited there, and when it did not exceed an inch in length, and it had each time again become attached to the nipple. I afterwards saw this fœtus attached to the nipple, and it continued to grow, without having sustained any apparent injury from the separation, until the death of the mother, when it was nearly ready to leave the pouch. A similar result occurred to Mr. Collie.'

The young one observed by Mr. Collie (see *Zoological Journal*, vol. v., p. 238) was of nearly the size of the last and half the middle joint of one's little finger; and the flesh-coloured integuments were so transparent as to permit the higher coloured vessels and viscera to be seen through them. The extremities seemed completely formed, and its muscular power was testified by its efforts in sucking, during which it put every part of its body in motion. 'According to the testimony of the person,' continues Mr. Collie, 'who preserved the mother with this little one for me, the latter by no means passes the whole of its time with the lacteal papilla in its mouth, but has been remarked, more than once, without having hold of it. It has even been wholly removed from the sac to the person's hand, and has always attached itself anew to the teat. Yesterday,* on again looking at it, I gently pressed, with the tip of my finger, the head of the little one away from the teat of which it had hold, and continued pressing a little more strongly for the space of a minute altogether, when the teat, that had been stretched to more than an inch, came out of the young one's mouth, and showed a small circular enlargement at its tip, well adapting it for being retained by the mouth of the sucker. The opening of the mouth seemed closed in on both sides, and only sufficiently open in front to admit the slender papilla. After this I placed the extremity of the teat close to the mouth of the young, and held it there for a short time, without perceiving any decided effort to get hold of it anew; when I allowed the sac to close, and put the mother into her place of security. An hour afterwards the young one was observed still unattached, but in about two hours it had hold of the teat and was actively employed in sucking.'

Professor Owen then refers to a similar experiment tried with a mammary fœtus about the size of a Norway rat by Mr. Morgan. This fœtus, after two hours' separation from the nipple, regained its hold, and sustained no injury from the interruption of the supply of nourishment. Mr. Owen concludes, therefore, that the evidence adduced establishes the fact that the mammary fœtus at a very early period is at least capable of sustaining a separation from the nipple; and although it may not at this stage of growth possess the power of regaining its hold by its own unaided efforts, it is far from being the inert and formless embryo that it has been described to be, resembling on the contrary, in its vital powers, the new-born young of the smaller *Mammalia* rather than the uterine fœtus of a larger species at a period of development when such a fœtus corresponds in size to a new-born Kangaroo; and although the latter possesses greater powers of action than the same-sized embryo of a sheep, and approximates more nearly in this respect to the new-born young of the rat, yet, Mr. Owen observes, it is evidently inferior to the latter. For, though enabled by the muscular power of its lips to grasp and adhere firmly to the nipple, its own unaided efforts seem incapable of drawing sustenance therefrom. The peculiar adaptation of a muscle, analogous to the cremaster, to the mammary gland, for the purpose of injecting the milk from the nipple into the mouth of the adherent fœtus, has been demonstrated by Professor Geoffroy and Mr. Morgan; and Mr. Owen remarks that it can scarcely be supposed that the fœtal efforts of suction should always be coincident with the maternal act of injection. If at any time this should not be the case, the consequences might be fatal from the forcible injection of milk into the larynx. To guard against this there is a special contrivance, first described by M. Geoffroy, the necessity for which appears to have been foreseen by John Hunter in his dissection of two small mammary fœtuses of the Kangaroo for the especial purpose of showing the relation of the larynx to the posterior nares (Nos. 3731, 3734, 3735, Mus. Coll. Reg. Chir., Physiological series), in which, as Mr. Owen states, there are evidences that Hunter had anticipated most of the anatomical discoveries which have subsequently been made upon the embryo of the Kangaroo. The epiglottis and arytenoid cartilages are elongated and approximated, and the rima glottidis is thus situated at the apex of a cone-shaped larynx which projects, as in the *Cetacea*, into the posterior nares, where it is closely embraced by the muscles of the soft palate. The air-passage is thus completely separated from the fauces, and the injected milk passes in a divided stream on either side the larynx to the œsophagus.

'Thus aided and protected by modifications of structure,' continues Professor Owen, 'both in the system of the mother and in its own, designed with especial reference to each other's peculiar condition, and affording therefore the most irrefragable evidence of creative foresight, the feeble offspring continues to increase from sustenance exclusively derived from the mother for a period of about eight months. The young Kangaroo may then be seen frequently to protrude its head from the mouth of the pouch, and to crop the grass at the same time that the mother is browsing. Having thus acquired additional strength, it quits the pouch, and hops at first with a feeble and vacillating gait, but continues to return to the pouch for occasional shelter and supplies of food till it has attained the weight of ten pounds. After this it will occasionally insert its head for the purpose of sucking, notwithstanding another fœtus may have been deposited in the pouch, for the latter, as we have seen, attaches itself to a different nipple from the one which had been previously in use.'

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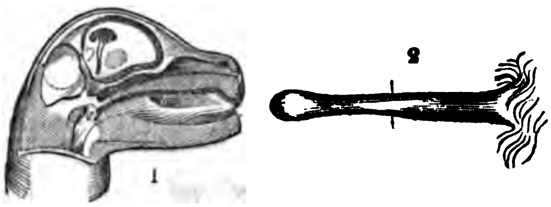
* N.B.—Mr. Owen observes that this argument is not applicable to those *Marsupiata* which, like *Perameles* and the smaller South American opossums, have the duplicatures of integument forming the pouch extended close to the cloaca.

* Mr. Collie's letter, which is addressed to Mr. Vigors, is dated '26th January, 1830.'



1. The head of a mammary fœtus of a Kangaroo, about eight weeks old, dissected to show the relation of the larynx to the tongue and posterior nares. *a*, the epiglottis, drawn down out of the aperture in the soft palate; *b*, the cavity in the tongue for the reception of the nipple. 2. The elongated nipple, withdrawn from the mouth: the dotted line shows the extent to which it is grasped; it never extends into the œsophagus or stomach, as has been conjectured. (Owen.)

For the observations made by Professor Owen on the structure of the female generative organs in the other Marsupials, as compared with those of Oviparous, Ovoviviparous, and Viviparous animals, we must refer to his paper above quoted, our space not permitting us to do more than call the reader's attention to the fact that his inductions rest principally on the examination of those organs in *Didelphys dorsigera*, *Petaurus pygmæus*, *Petaurus Taguanoides*, *Dasypus viverrinus*, *Didelphys Virginiana*, *Hypsiprymnus Whitei*, and *Macropus major*. His remarks on the inferiority of the cerebral development of the Marsupials will be read with great interest as bearing on the structure and analogies of those organs, and other points of resemblance to the lower vertebrate classes, especially to the reptiles. 'Those marsupial quadrupeds which I have had an opportunity of observing alive in the Zoological Gardens,' says the professor (' and there are at present (1834) species of *Dasyurus*, *Didelphys*, *Phalangista*, *Petaurus*, *Hypsiprymnus*, *Macropus*, and *Phascalomys*), are all characterised by a low degree of intelligence; nor can I learn that they ever manifest any sign of recognition of their keepers or feeders. Another character, no less uniformly belonging to them, is the want of a power of uttering vocalised sounds. When irritated they emit a wheezing or snarling guttural sound; that of the *Dasyurus ursinus* is the clearest, and is the nearest approach to a growl. Mr. Harris however states that in addition to this noise, the Ursine Opossum utters a kind of hollow barking. The *Thylacinus cynocephalus*, or large Dog-faced Opossum, he observes, utters ' a short guttural cry, and appears exceedingly inactive and stupid, having, like the owl, an almost constant motion with the nictitating membrane of the eye.' The Wombat, when irritated, emits a loud hiss, which forcibly reminds one of that of the serpent. The noise emitted by the Kangaroo under similar circumstances is equally remote from a vocalised sound; the necessary apparatus for producing which, Cuvier long ago observed to be wanting in the larynx of this animal. It is interesting to find these analogies to the *Reptilia*, and more might be pointed out if it were not a comparison which merits a separate consideration.' The reader who would pursue his inquiries as to the generative system of the Marsupialia may also consult the previous writings of Daubenton, Rengger, and Leuckart. The museum of the Royal College of Surgeons will afford ample materials for following out the organization of this extraordinary group in the skeletons and preparations preserved in the Physiological Series of that noble institution The following is the arrangement, based on the organization of the animals, proposed by Professor Owen in a paper read to the Zoological Society of London on the 8th and 22nd of January, 1839.

Classification of the Marsupialia.

Tribes.	Families.	Genera.	Subgenera.
SARCOPHAGA. Three kinds of teeth; canines long in both jaws; a simple stomach; no intestinum cæcum.	*Dasyuridæ* . .	Thylacinus. Dasyurus. Phascogale.	
. . . .	Extinct transitional forms.	Phascalotherium Thylacotherium } fossil.	
ENTOMOPHAGA. Three kinds of teeth in both jaws; simple stomach; a moderately long *intestinum cæcum*.	*Ambulatoria* . .	Myrmecobius.	
	Saltatoria . . .	Chœropus. Perameles.	
	Scansoria . . .	Didelphys . . .	Cheironectes.
CARPOPHAGA. Anterior incisors large and long in both jaws; canines inconstant; a simple stomach; a very long *intestinum cæcum*.	*Phalangistidæ* . .	Phalangista . . .	Cuscus. Pseudocheirus. Tapoa (Gray).
		Petaurus	Ascobates.
	Phascolarctidæ .	Phascolarctos.	
POEPHAGA. Anterior incisors large and long in both jaws, canines present in the upper jaw only or wanting; a complex stomach; a long *intestinum cæcum*.	*Macropodidæ* . .	Hypsiprymnus.	
		Macropus	Halmaturus. Macropus.
RHIZOPHAGA.* Two scalpriform incisors in both jaws; no canines; stomach with a special gland; cæcum short, wide, with a vermiform appendage.	*Phascolomyidæ* .	Phascolomys. Diprotodon (fossil)	

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* The terms given to the tribes or primary groups of Marsupialia in the classification are not to be understood as strictly indicating the food of the species severally included therein, but only their general tendency to select for their support the substances implied by those designations.

We now proceed to give a succinct illustration of the genera and some of the subgenera above mentioned.

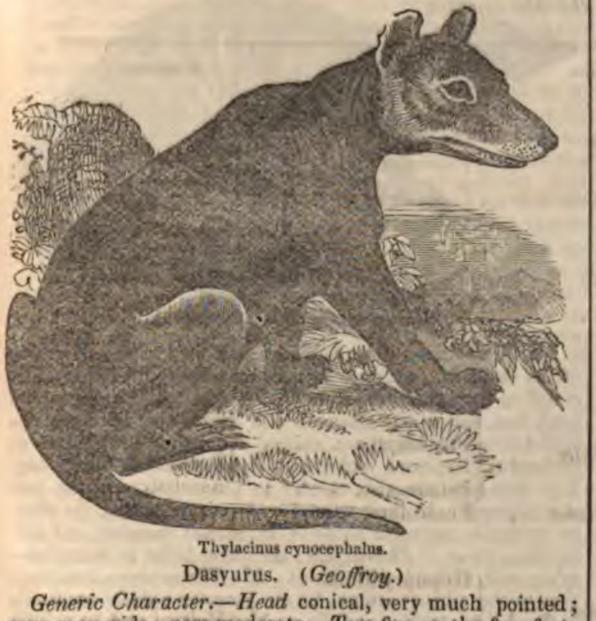
Thylacinus. (*Temminck.*)

Generic Character.—Dental Formula:—Incisors $\frac{8}{6}$, Canines $\frac{1-1}{1-1}$, Molars $\frac{7-7}{7-7}$ = 46. The incisors are ranged in a semicircle, equal, and separated in the middle in each jaw by a vacant space; the external incisor on each side is the stoutest; the canines are of considerable size, curved and pointed like those of the Cats and Dogs; the last molars are armed with three obtuse tubercles, resembling those of the two groups of *Carnivora* last mentioned. *Toes* five on each fore-foot, and four on each hind-foot.

Example, *Thylacinus cynocephalus* (*Dasyurus cynocephalus* of Geoffroy, *Thylacinus Harrisii* of Temminck).

Description.—Size of a young wolf; the short smooth hair of a dusky yellowish-brown above, barred or zebraed on the lower part of the back and rump with about sixteen jet-black transverse stripes, broadest on the back and gradually tapering downwards, two of which extend a considerable way down the thighs. The ground-colour on the back inclines to blackish gray. *Tail* much compressed and tapering to a point.

Habits and *Locality.*—Mr. Harris, from whose paper in 'Linn. Trans.' our description and figure are taken, states that this species, the largest of the Australian *Carnivora*, inhabits amongst caverns and rocks in the deep and almost impenetrable glens in the neighbourhood of the highest mountainous parts of Van Diemen's Land, where it probably preys upon the brush (bush?) Kangaroo and various small animals that abound in those places. The individual from which the description and drawing were taken was caught in a trap baited with Kangaroo-flesh. It remained alive but a few hours, and during that period uttered the cry and presented the appearances quoted by Mr. Owen. In its stomach were found the partly-digested remains of a Porcupine Ant-Eater (*Echidna aculeata*). The vulgar names for this species are, the *Zebra Opossum*, *Zebra Wolf*, &c.



Thylacinus cynocephalus.

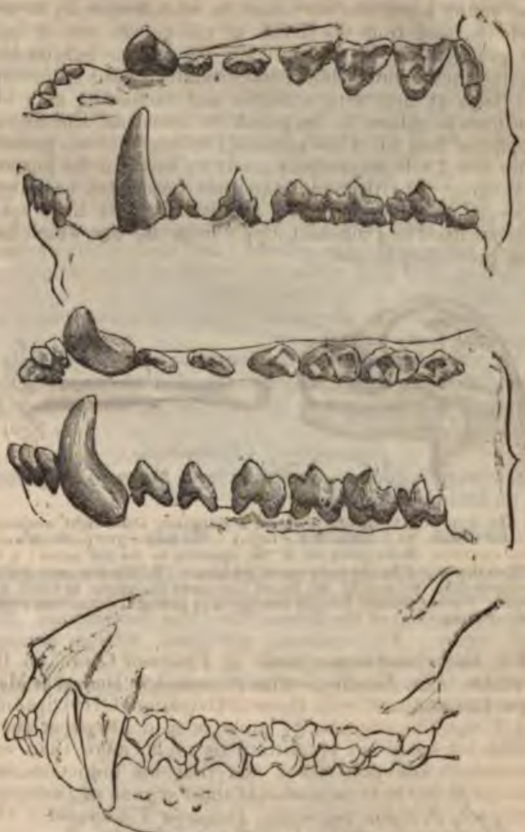
Dasyurus. (*Geoffroy.*)

Generic Character.—*Head* conical, very much pointed; gape very wide; ears moderate. *Toes* five on the fore-feet; on the hind-feet the great toe is reduced to a tubercle or is entirely absent.

Dental Formula:—Incisors $\frac{8}{6}$, Canines $\frac{1-1}{1-1}$, Molars $\frac{6-6}{6-6}$ = 42.

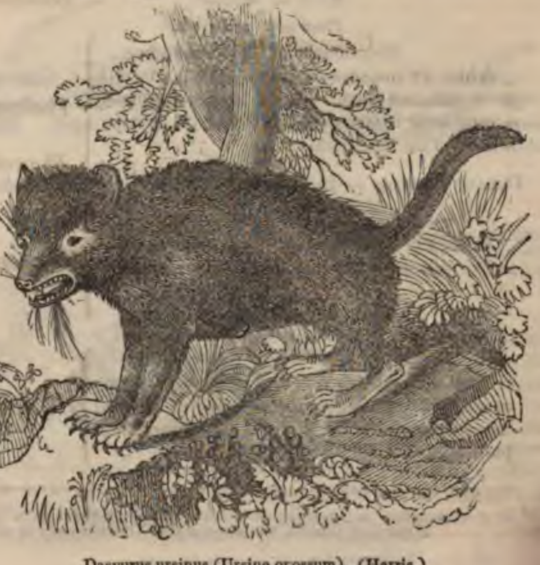
Example, *Dasyurus ursinus* (*Didelphis ursina* of Harris).

Description.—Head, body, legs, and upper part of the tail covered with long, coarse, black hair, irregularly marked with one or two blotches of white; in some specimens on the shoulders, in others on the throat or rump. Tail slightly prehensile, its under part bare. (Harris.)



Teeth of Dasyurus (Dasyurus macrurus)

Habits and Locality.—This species, which is very voracious, and burrows in the ground in Van Diemen's Land, is of the size of a badger. 'These animals,' says Mr. Harris, 'were very common on our first settling at Hobart Town, and were particularly destructive to poultry, &c. They however furnish the convicts with a fresh meal, and the taste was said to be not unlike veal. As the settlement increased, and the ground became cleared, they were driven from their haunts near the town to the deeper recesses of forests yet unexplored. They are however easily procured by setting a trap in the most unfrequented parts of the woods, baited with raw flesh, all kinds of which they eat indiscriminately and voraciously; they also, it is probable, prey on dead fish, blubber, &c., as their tracks are frequently found on the sands of the sea-shore. In a state of confinement they appear to be untameably savage; biting severely, and uttering at the same time a low yelling growl.



Dasyurus ursinus (Ursine opossum). (Harris.)

A male and female, which I kept for a couple of months chained together in an empty cask, were continually fighting; their quarrels began as soon as it was dark (as they slept all day), and continued throughout the night almost without intermission, accompanied with a kind of hollow barking, not unlike a dog, and sometimes a sudden kind of snorting, as if the breath was retained a considerable time, and then suddenly expelled. The female generally conquered. They frequently sat on their hind parts, and used their fore-paws to convey food to their mouths. The muscles of their jaws were very strong, as they cracked the largest bones with ease asunder; and many of their actions, as well as their gait, strikingly resembled those of the bear. Its vulgar name is the Native Devil.'

The specimen in the garden of the Zoological Society was a snarling surly animal.

Mr. Owen's account of the dissection of a *Dasyurus macrurus*, or *Long-tailed Dasyurus* (*Spotted Martin* of Phillip's Voyage), will be found in the 'Zoological Proceedings' for 1835.

Phascogale. (*Temminck.*)

Generic Character.—Differing from *Dasyurus*, especially in its Dental Formula:—

Incisors $\frac{8}{6}$; Canines $\frac{1-1}{1-1}$; Molars $\frac{7-7}{7-7} = 46$.

Example, *Phascogale penicillata* (*Didelphis penicillatus* of Shaw, *Dasyurus penicillatus* of Geoffroy). Size rather larger than that of the Brown Rat (*Mus decumanus*). Tail very bushy. Fur uniform, ash-colour, whitish beneath, short, woolly, and very thick.

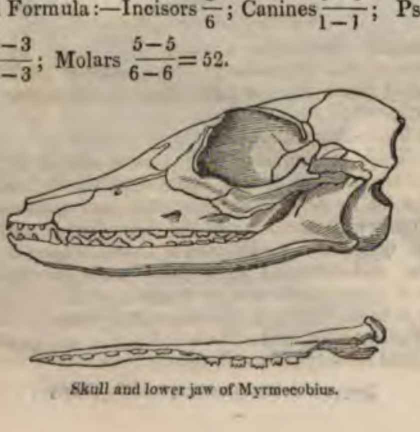
Habits and Locality.—This *Phascogale* lives on trees in New Holland.

Phascogale penicillata.

Myrmecobius. (Waterhouse.)

Generic Character.—*Fore-feet* with 5 toes; hind-feet with 4 toes, all free. *Head* elongated, snout produced; ears moderate, narrower, and subacute at the apex. *Body* slender. *Tail* moderate.

Dental Formula:—Incisors $\frac{8}{6}$; Canines $\frac{1-1}{1-1}$; Pseudo-molars $\frac{3-3}{3-3}$; Molars $\frac{5-5}{6-6} = 52$.

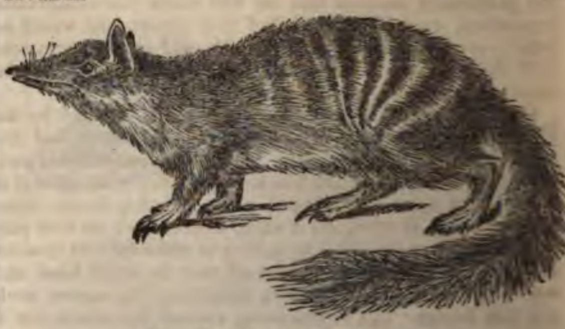


Skull and lower jaw of Myrmecobius.

Example, *Myrmecobius fasciatus.*

Description.—Fore part of the body reddish, gradually blended into the black, which is the prevailing colour of the posterior half, and which is adorned with nine white bands. Fur of two kinds. Under hair scanty and whitish grey; upper hair rather coarse, short, and adpressed on the anterior parts; long on the posterior and under parts; hairs on the anterior part of the back generally black at the base and fulvous at the apex; those on the head very short, brownish above, being composed of a mixture of black, fulvous, and a few white hairs; a few black hairs spring from the sides of the muzzle and under each eye; hair of the tail long and rather bushy; most of the hairs on the under part fulvous at the base and white at the tip; those on the under side of the tail generally black at the base and white at the apex. Length from nose to root of tail 10 inches; length of tail to the end of the hair 7 inches.

Habits and Locality.—Mr. Waterhouse, in his paper in the 'Transactions of the Zoological Society,' descriptive of this animal, gives the following account of the two specimens on which his description is founded. The first was procured by Lieutenant Dale of Liverpool, whilst on an exploring party in the interior of the country at the Swan River Settlement, and was discovered about ninety miles to the south-east of the mouth of that river. Two of these animals, according to Lieut. Dale, were seen within a few miles of each other; they were first observed on the ground, and on being pursued, both directed their flight to some hollow trees which were near. The party succeeded in capturing one of them; the other was unfortunately burnt to death in their endeavour to dislodge it by fumigating the hollow tree in which it had taken refuge. The country in which they were found abounded in decayed trees and ant-hills. Mr. Waterhouse was informed that the second individual was found in Van Diemen's Land (but he suspects some mistake here), and that others similar to it had been seen in the act of burrowing or digging at the roots of trees in search after insects. Their favourite haunts are stated to be in those situations in which the Port Jackson willow abounds.



Myrmecobius fasciatus. (Waterhouse.)

Mr. Waterhouse observes, that although in the structure of the skull *M. fasciatus* evinces an affinity to *Phascogale*, it differs from that genus in the want of a thumb to the hind-feet, and in the strength and larger size of the claws of the fore-feet, which are shaped somewhat like those in the genus *Herpestes*, and are evidently suited to burrowing. The fore-legs are also stouter in proportion, and the feet are stronger. In their narrow and pointed shape, the ears, he remarks, resemble those of *Perameles nasutus*, and differ from those of *Phascogale;* they also differ in being tolerably well clothed with hairs. Mr. Waterhouse imagines that in the present animal he can perceive a slight approach to the *Edentate Marsupialia*, or *Monotremes*, and he thinks that analogically it may be compared to the genus *Tupaia* among the true *Insectivora*, bearing a somewhat similar connection with *Echidna* and *Ornithorhynchus* to that which exists between the last-mentioned genus and the genera *Erinaceus* and *Mygale*. In conclusion he adds that it must be allowed that there is a greater dissimilarity in structure between the last-mentioned genus and the genera *Myrmecobius* and the *Monotremes*, than between *Tupaia* and *Mygale;* we are however prepared for this, by the comparatively sudden transitions from one form to another which we find in the *Marsupialia*, which group, it must be borne in mind, stands low in the grade of organization among the Mammalia. (*Zool. Trans.*, vol. ii.)

Chœropus. (*Ogilby.*)

On the 13th March, 1838, Mr. Ogilby exhibited to a meeting of the Zoological Society of London a drawing, made by Sir Thomas Mitchell, of a Marsupial animal found by that officer on the banks of the river Murray, during his late journey in the interior of New South Wales. Mr. Ogilby stated his original belief that the animal in question belonged to the genus *Perameles*, under which impression he had proposed to name it *Per. ecaudatus*, from its entire want of tail, a character found in no other species of the same group; but a drawing of the fore-foot, afterwards found by Sir Thomas Mitchell, and likewise exhibited to the Society on the present occasion, had considerably shaken this first opinion, and induced Mr. Ogilby to suspect that the animal may eventually form the type of a new genus. According to Sir Thomas Mitchell's drawing, and the notes which he took at the time of examining the specimen, it would appear that there were only two toes on the fore-feet, which were described as having been so perfectly similar to those of a pig, as to have procured for the animal the name of the pig-footed bandicoot, among the persons of the expedition.

The drawing of the foot, in fact, very closely resembles that of the genus *Sus* in form and characters; two toes only are represented, short, and of equal length; but there is a swelling at the base of the first *phalanges*, which renders it probable that there may be two smaller ones behind. The *Perameles*, on the contrary, have three middle toes on the fore-feet, all of equal length, and armed with very long powerful claws, besides a small rudimentary toe very distinctly marked on each side. The form and character of the hind-feet were perfectly similar to those of the *Perameles*; as were also the teeth, as far as could be judged from the drawing, except that the canines did not appear to surpass the anterior molars in point of size. The ears were long, elliptical, and nearly naked; the head broad between the ears, and very much attenuated towards the muzzle; the body about the size of a small rabbit, and the fur very much of the same quality and colour as in that animal. Mr. Ogilby, after expressing his confidence in the fidelity of Sir Thomas Mitchell's drawings, and the care with which that gentleman assured him he had made the observation in question, expressed his belief that this animal would be found to constitute a new genus of Marsupials, and proposed for it the provisional name of *Chœropus*, in allusion to the described characters of the fore-feet.

The following is the notice of this animal inserted by Sir Thomas Mitchell in his journal, on the occasion of first discovering it. 'June 16, 1836. The most remarkable incident of this day's journey was the discovery of an animal of which I had seen only a head in a fossil state in the limestone caves of Wellington Valley, where, from its very singular form, I supposed it to belong to some extinct species. The chief peculiarity then observed was the broad head and very long slender snout, which resembled the narrow neck of a wide bottle; but in the living animal the absence of a tail was still more remarkable. The feet, and especially the fore-legs, were also singularly formed, the latter resembling those of a pig; and the marsupial opening was downwards, and not upwards, as in the Kangaroo and others of that class of animals. This quadruped was discovered by the natives on the ground; but on being chased, it took refuge in a hollow tree, from which they took it alive, all of them declaring that they had never before seen an animal of the kind. This was where the party had commenced the journey up the left bank of the Murray, immediately after crossing that river.' Such, Mr. Ogilby remarked, was all the information he possessed at present with regard to this singular animal; but Mr. Gould had promised to examine the original specimen on his arrival at Sydney, in the Museum of which town it had been deposited; and Mr. Ogilby therefore hoped that, through the kindness of that gentleman, he should shortly have it in his power to communicate a more detailed description of its form and characters to the Society. (*Zool. Proc.* 1838.)

Dental Formula:—

Jaw	Upper	4 incisors,	4 spurious molars,*	3 or 4 molars
		4 ,,	4 ,,	3 or 4 ,,
	Lower	3 incisors,	4 spurious molars,	3 or 4, perhaps 5
		3 ,,	4 ,,	3 or 4 ,, 5.

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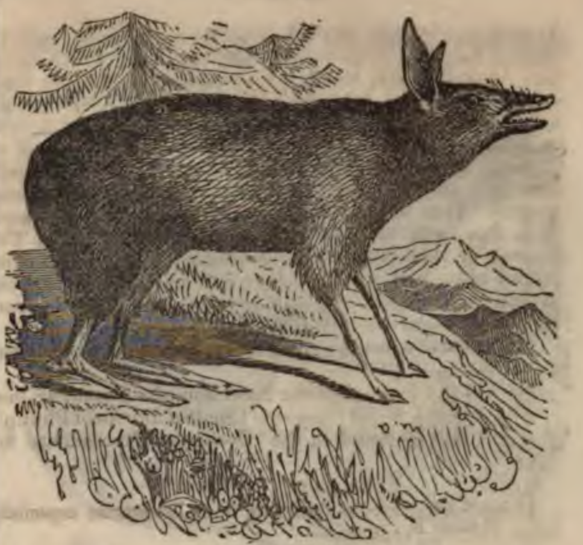
* The anterior of these might be termed canines.

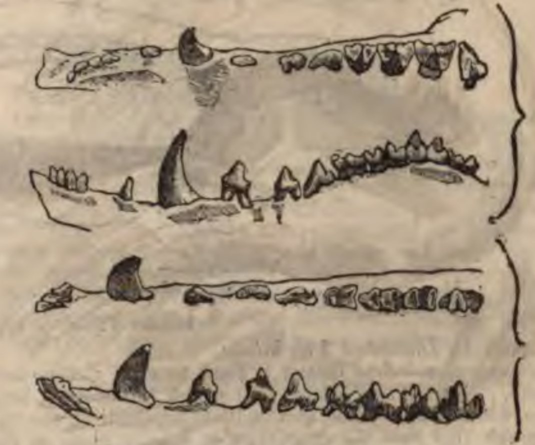


Chœropus ecaudatus.

Perameles. (*Geoffroy.*)

Generic Character.—Head elongated, pointed; ears moderate, hairy; posterior great-toes rudimentary, and the two succeeding toes united by the skin up to the nails, great toe and little toe of the fore-feet with the form of simple tubercles, so that they wear the appearance of having only three anterior toes.

Dental Formula:—Incisors $\frac{10}{6}$; canines $\frac{1-1}{1-1}$; molars $\frac{7-7}{7-7} = 48$.



Teeth of Perameles. (F. Cuvier.)

Example, *Perameles nasutus.*

Description.—Head very long; muzzle produced; nose prolonged above the jaw; fur grey-brown above and white beneath.

Locality.—Australia.

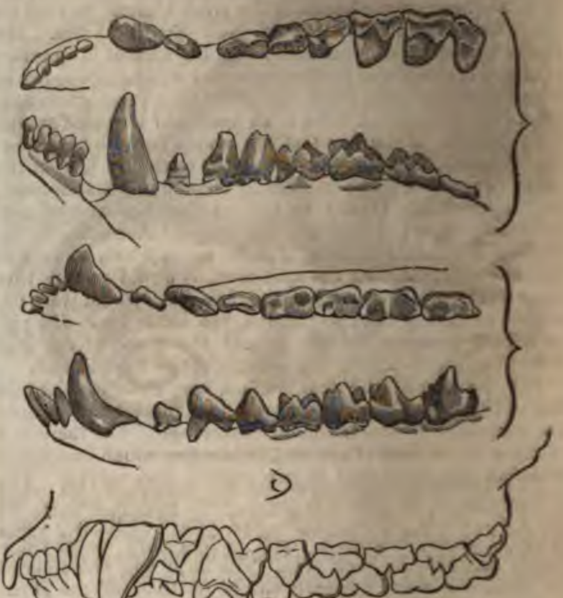
Mr. Gray, in characterizing a new species of Perameles (*Per. Gunnii*), very closely agreeing with *Per. nasutus*, but peculiar for its very short white tail, and in having several indistinct white bands over the haunches, stated that *Per Gunnii* inhabits Van Diemen's Land, where it frequents gardens, and commits great havoc amongst bulbous roots, which it is said to devour with avidity (*Zool. Proc.*, 1838). There is now (1839) a specimen of *Perameles Lagotis*, o *Rabbit Perameles*, from Swan River, in the garden of t Zoological Society in the Regent's Park.

Perameles nasutus.'

Didelphys. (*Linnæus.*)

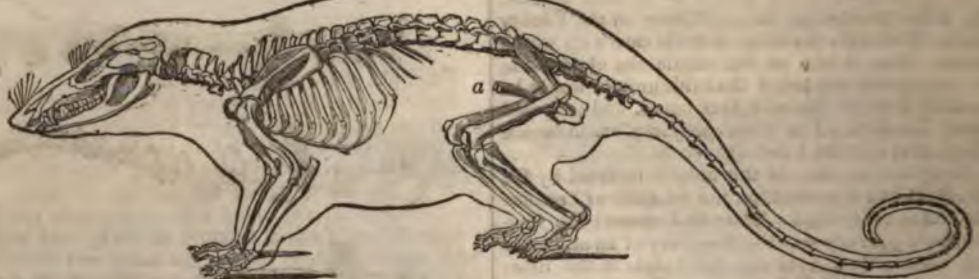
Generic Character.—Head very much pointed, gape wide, tongue rough with horny papillæ; ears large and naked; eyes small; tail long and tapering, flexible, and prehensile, with hair at the base only, the remaining part being covered with scales. Fore-feet with five toes, all armed with strong, sharp, curved claws; thumb of the hind-foot opposable and destitute of nail or claw, the other toes or fingers armed with claws like those of the fore-feet.

Dental Formula:—Incisors $\frac{10}{8}$; canines $\frac{1-1}{1-1}$; molars $\frac{7-7}{7-7} = 50$.



Teeth of Didelphys Virginiana. (F. Cuvier.)

Geographical Distribution of the Genus.—America exclusively.



Skeleton of Didelphys Virginiana. *a*, the marsupial bones.

Example, *Didelphys Virginiana.*

Description.—Size that of a domestic cat. *Colour* dull white. *Hair* of two kinds; that which is lowest, a long fine woolly down, white at the base, brownish at the tip, through this pass the long hairs of a pure white on the head, neck, and upper parts of the body; the hair is short and close. Round each eye a brownish circle. Ears generally black at the base and yellowish at the tip. Whiskers long, partly white, partly reddish. Extremity of the nose flesh-coloured, with a tinge of yellow. Legs deep chestnut brown. Tail not so long as the body, covered at the base by long hairs, but only scantily furnished with bristles, which come out from between the whitish scales that protect it, for the greater part of its length.

Habits and Locality.—The Virginian Opossum is an arboreal animal, as might be expected from the structure of its posterior feet or hands especially. It appears to be to a certain degree carnivorous, for it preys upon insects and birds, and feeds also on fruits; but there is reason for believing that animal food forms its principal support, for it sometimes invades the farm-yards in its neighbourhood. According to Barton, the period of uterine gestation in this species is twenty-six days. It inhabits North America, and was, perhaps is, very abundant in the North of Mexico, and nearly throughout the United States, where it is called the opossum. In the *Perfect Description of Virginia* (1649), we find, in the catalogue of animals, '*Passonnes*—This beast hath a bagge under her belly, into which she takes her young ones, if at any time affrighted, and carries them away.' Lawson says, 'The *Possum* is found nowhere but in America. She is the wonder of all the land animals, being the size of a badger and near that colour. The female doubtless breeds her young at her teats, for I have seen them stick fast thereto, when they have been no bigger than a small rasberry, and seemingly inanimate. She has a paunch or false belly, wherein she carries her young, after they are from those teats, till they can shift for themselves. Their food is roots, poultry, or wild fruits. They have no hair on their tails, but a sort of a scale, or hard crust, as the beavers have. If a cat has nine lives, this creature surely has nineteen; for if you break every bone in their skin, and mash their skull, leaving them for dead, you may come an hour after, and they will be gone quite away, or perhaps you may meet them creeping away. They are a very stupid creature, utterly neglecting their safety. They are most like rats of anything. I have, for necessity in the wilderness, eaten of them. Their flesh is very white, and well tasted; but their ugly tails put me out of conceit with that fare. They climb trees as the racoons do. Their fur is not esteemed nor used, save that the Indians spin it into girdles and garters.' The tail appears to be not alone of use as an organ of prehension to the adult animal; for it is stated that the little ones when advanced in growth leap upon their mother's back if they are frightened, and, twisting their tails round hers, escape with her assistance the threatened danger.* In captivity the animal is sullen, snarling, and stupid.

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* In the British Museum there is a stuffed specimen of Didelphys dorsigera beautifully prepared, with the young in this position.

Didelphys Virginiana (Virginian Opossum).

The French name *Sarigue* for the species of this genus is evidently a form of *Carigueya*, the Brazilian name for the genus. They are known in Paraguay under the name of *Micouré*, in the American Islands under that of *Manicou*, and in Mexico by the appellation of *Tlaquatzin*.

Cheironectes. (Illiger.)

Generic Character.—The complete dental formula of this subgenus does not appear to be known. The number of incisors is stated at ten above and eight below. *Head* rather pointed; ears naked, rounded; tail scaly, prehensile; an opposable thumb on the hind feet or hands, and the toes webbed.

Example, *Cheironectes palmatus* (*Cheironectes Yapock* of Desmarest; *Didelphis palmata* of authors).

Description.—Fur brown above, with three transverse bright grey bands, interrupted in the middle; white below. Size larger than that of the brown rat.

Habits and Locality.—The river Yapock, or Oyapock (the boundary that separates the French Settlements from Brazil), in Guyana, is the place where this species has been found. It swims with facility; indeed Buffon describes it under the name of *Petite loutre de la Guyane*.

Cheironectes palmatus.

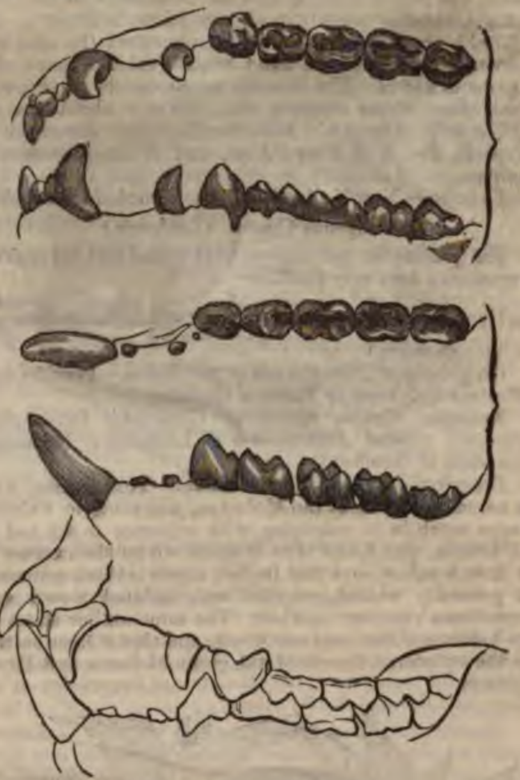
Phalangista. (Cuvier.)

Generic Character.—*Head* rather short; ears hairy; fur woolly and short; no extensible membrane between the anterior and posterior limbs; *tail* long, prehensile, sometimes without hair on its extremity.

Subgenus Phalangista, properly so called—Balantia (Illiger).

Tail prehensile, but covered with hair; ears long and erect.

Dental Formula·—Incisors $\frac{6}{2}$; canines $\frac{4}{0}$; pseudo-molars $\frac{4}{8}$; molars $\frac{8}{8}=40$.[*]



Teeth of Phalangista. (F. Cuvier.)

Example, *Phalangista vulpina*.

Description.—The following description of this species is given in Phillip's *Voyage*:—'Vulpine Opossum. This is not unlike the common fox in shape, but considerably inferior to it in respect to size, being from the point of the nose to the setting on of the tail only 26 inches; the tail itself 15 inches: the upper parts of the body are of a grisly colour, arising from a mixture of dusky and white hairs, with rufous yellow tinge; the head and shoulders partaking most of this last colour: round the eyes blackish: above the nostrils ten or twelve black whiskers, four inches or more in length: all the under parts of the body are of a

Phalangista vulpina (Vulpine Opossum).

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[*] Lesson gives the dentition of Phalangista as, Incisors $\frac{6}{2}$, canines 0, molars $\frac{8-8}{7-7}=38$.

tawny buff colour, deepest on the throat, where the bottom of the hairs are rust colour: the tail is of the colour of the back for about one quarter of its length, from thence to the end black: the toes on the fore-feet are five in number, the inner one placed high up: on the hind-feet four toes only; with a thumb, consisting of two joints, without a claw, placed high up at the base of the inner toe: the whole foot serving the purpose of a hand, as observable in many of the Opossum genus. The legs are much shorter in proportion than those of the common fox: the ears about one inch and a half in length.' It is the *Phalanger Renard* of the French, *Bruno* of Vicq-d'Azyr, and *Whatapooroo* of the natives.

Locality.—New Holland; neighbourhood of Port Jackson.

Subgenus Cuscus. (*Lacépède.*)

Tail prehensile, but in great part naked and covered with rugosities; ears very short.

Dental Formula:—Incisors $\frac{6}{6}$; canines 0; molars $\frac{6-6}{8-8}$ $= 40$. (Lesson.)

Geographical Distribution of the Genus.—Peculiar to the Western Polynesia or Malaisia (Lesson).

Example, *Cuscus maculatus* (*Didelphis Orientalis* of Gmelin; *Cuscus Amboinensis* of Lacépède; *Phalangista maculata* of Geoffroy).

Description, Habits, and Locality.—This species, which is named Coescoes at the Moluccas, according to Valentyn, varies much in its colouring, with reference to sex and age. M. Lesson, who found it at Wagiou, where the natives call it *Scham-scham*, says that its fur, which is thick and woolly, is generally whitish, covered with isolated brown spots, sometimes running together. The same author states that its habits are slow and nocturnal, and that it lives on fruits in the equatorial forests of the great Molucca and Papuan Islands.

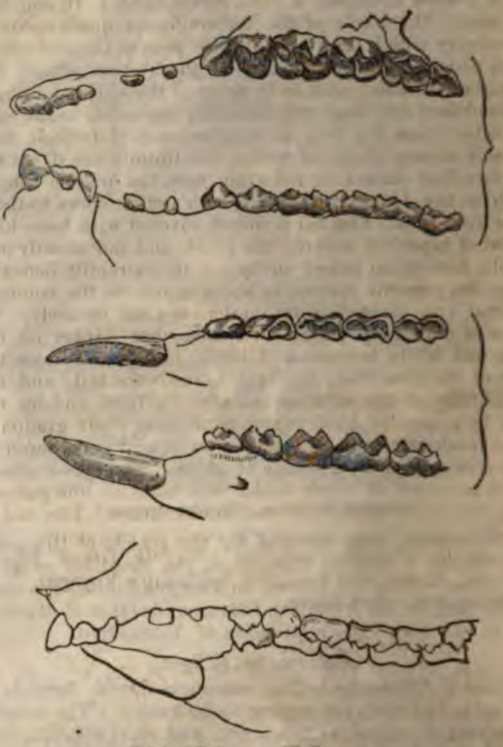
Cuscus maculatus.

Petaurus. (Shaw.)

Generic Character.—*Head* rather short; ears small and hairy; skin of the flanks extended between the anterior and posterior limbs, and covered with hair; tail not strictly prehensile.

Dental Formula:—Incisors $\frac{6}{2}$; canines $\frac{0-0}{0-0}$; molars $\frac{8-8}{7-7} = 38$.

It will be observed that the number of lower molar teeth given in the cut amounts only to five, and consequently does not correspond with the formula above given, or with that stated by M. F. Cuvier himself, who makes the total number of teeth 22 in the upper jaw, and 16 in the lower, and the number of upper false molars 8, and of molars 8 also; the number of lower molars being 6 false and 8 true, = 38 in all. He tells us that this form of dentition is taken from *Phalangista Cookii*, *Petaurus Taguanoides*, '*Le Phalanger didelphoide* or *Le Macraure* of M. Geoffroy, and a species which has no name.'



Teeth of Petaurus. (F. Cuvier.)

Mr. Bennett, who, in common with Cuvier, Desmarest, and Lesson, has placed the interesting species which we have chosen as the example under the genus *Petaurus*, remarks that M. F. Cuvier, relying solely on the discrepancy or agreement of the dentary systems, and putting entirely out of the question all consideration of other and essential points of structure, has reunited the old genus *Phalangista*, in order again to subdivide it into two incongruous and heterogeneous groups; in the one confounding two well marked species of flying *Petauri* not only with the climbing *Phalangistæ* of New Holland, but with the naked-tailed and strictly prehensile Couscous of the Moluccas; repaying the other group, which he had so unnecessarily dismembered, by the addition of a true *Phalangista*, whose only pretensions to such an association are made to depend on a somewhat similar arrangement of the teeth. 'By thus confining himself to a single character,' continues Mr. Bennett, 'he has broken up the regular series of affinities which connected together three marked but still closely allied gradations of form, to substitute an arrangement which has no other recommendation than the theoretic views of its author. In such a case we cannot hesitate in giving to the organs of locomotion, combined with the general habit, that precedence before those of mastication, which, under other circumstances, we are generally in the habit of conceding to the latter; and we feel the less repugnance to adopting this course, because it is admitted that the dentary formula is in these animals subject to some variation, and because zoologists are by no means agreed with respect to its exact definition. The teeth of the *Squirrel Petaurus* agree generally, according to M. F. Cuvier, with those of the Phalangistas. They are consequently 38 in number, 20 occupying the upper jaw, and 18 the lower. The former are divided by the same eminent naturalist into six incisors, four canines, two false molars, and eight true ones; the latter consisting of two incisors, and no canines, with eight false and as many true molars. The dentary character of the original species of *Petaurus*, which he takes as the type of his other group, differs chiefly in the total want of canine teeth; but we may here be permitted to observe that it appears to us somewhat doubtful how far those which are above enumerated as such truly deserve the name which has been applied to them. In every other respect the little creature in question perfectly agrees with the group of animals to which we have restored it; and which are at once characterised by the broad expansion of their skin on each side of the body, extending between the anterior and posterior limbs, as in the Flying Squirrels, to which indeed they bear a close resemblance. In common with nearly the whole of the mammiferous quadrupeds of the country which they inhabit, they possess the abdominal pouch which fixes their place in the system among the marsupial animals; and, as in many of these, the thumbs of the hind-feet are long and distinctly opposable to the sole. The other toes are four in number, and furnished with tolerably strong claws, of which the thumbs are destitute. The fore-feet have long radiating toes, the middle one of which is the longest, all armed with similar claws to those of the hind-feet. The tail is round, covered with loose hair, somewhat tapering towards the point, and not strictly prehensile, having no naked surface at its extremity beneath. In size the present species is about equal to the common Squirrel, and its tail is rather longer than its body. Its colour is delicately gray above, somewhat darker on the head, and white beneath. A black line passes from the point of the nose along the back towards the tail; and the lateral folds of the skin are bounded in front and on the sides by a similar band, which confounds itself gradually in the inside with the gray of the body, and is bordered at the outer margin by a fringe of white. The eyes are each placed in a spot of black, and a faint blackish line extends along the upper surface of the hinder limbs. The tail is also of a darker hue, especially towards its extremity.

Example, *Petaurus sciureus* (*Norfolk Island Flying Squirrel*, figured and described in Phillip's Voyage).

Description.—See above.

Petaurus Sciureus (Squirrel Petaurus).

Habits and Locality.—'During the day,' says Mr. Bennett, 'the animal generally remains quietly nestled in the hollows of trees, but becomes animated as night advances, and skims through the air, supported by its lateral expansions, half leaping, half flying from branch to branch, feeding upon leaves and insects. This peculiar mode of locomotion can scarcely be considered as a true flight, inasmuch as the cutaneous folds which serve the purposes of wings seem rather destined for the mere support of the animal in its long and apparently desperate leaps, than for raising it in the air and directing its course towards any given object. For this latter purpose they are indeed but little fitted by their structure, the want of proper muscles in a great measure incapacitating them from performing such offices as are dependent on volition. It may be doubted however whether these animals are entirely destitute of the power of exercising their will in their flight-like leaps. For the following anecdote bearing upon this subject we are indebted to our friend Mr. Broderip, who related it to us on unquestionable authority. On board a vessel sailing off the coast of New Holland was a Squirrel Petaurus, which was permitted to roam about the ship. On one occasion it reached the mast-head, and as the sailor who was despatched to bring it down approached, made a spring from aloft to avoid him. At this moment the ship gave a heavy lurch, which, if the original direction of the little creature's course had been continued, must have plunged it into the sea. All who witnessed the scene were in pain for its safety; but it suddenly appeared to check itself, and so to modify its career that it alighted safely on the deck.' Those that we have seen in captivity are in a state of somnolency all day; one kept at the Garden in the Regent's Park was formerly in the possession of the then marchioness of Cleveland. At night it was lively and active, and was perfectly tame, but rather shy. The species inhabits New South Wales, and is said to be abundant at the foot of the Blue Mountains. There seems to be no authority for the locality of Norfolk Island as a habitat of this very pretty little animal, excepting the figure and description in Phillip's Voyage above alluded to. The fur would be highly ornamental from its colour, softness, and beauty, as an article of dress.

Phascolarctos (*De Blainville; Lipurus, Goldfuss;* Amblotis, *Illiger*).

Generic Character.—*Body* stout. *Head* short, ears shaggy. *Limbs* rather short, robust, and nearly equal in length. *Toes* five on each fore-foot; the anterior toes divided into two groups for prehension, the thumb and the fore-finger being in one group, and the remaining three fingers in the other, the thumb of the posterior foot very large, but without a nail, and the two inner fingers united. *Tail* very short, almost null. Mr. Martin says that it differs from the *Wombat* in its dental formula, in which respect it closely resembles the Kangaroos.

Dental Formula:—Incisors $\frac{6}{2}$; canines $\frac{1-1}{0-0}$; spurious molars $\frac{1-1}{1-1}$; true molars $\frac{4-4}{4-4} = 30$.

The canines are small, and in the intermaxillary suture. The false molars are compressed and trenchant, but thicker than in *Hypsiprymnus*, the dentition of which, otherwise, that of the *Koala* resembles closely. The lower true grinders are narrower than the upper ones, and both quadricuspid.

Only one species is known, namely *Phascolarctos cinereus* (*Lipurus cinereus* of Goldfuss; *Phascolarctos fuscus* of Desmarest; *Phascolarctos Flindersii* of Lesson. The *Ashy Koala*).

Phascolarctos cinereus (Ashy Koala).

Description, Habits, and Locality.—As large as a dog of moderate size. Fur long, thick, rather coarse, and ashy brown, tufted ears rather lighter. It is said to have the gait and carriage of a young bear, to be arboreal in its habits, and to pass its life upon trees and in dens or holes which it hollows at their feet. Of its powers of climbing there can be no doubt; the structure of its extremities would lead to this inference, and actual observation has confirmed it. Its locality is New Holland, and we are enabled to give figures of the parent and young, taken by the kind permission of a friend, from a very accurate and beautiful drawing executed from the living animals, the first that were known in the colonies. They were brought in by natives to Colonel Paterson, then lieutenant-governor of the colony, from the Hat Hill district, to the southward of Port Jackson, in 1803. The native name 'Koala' is said to signify 'Biter.'

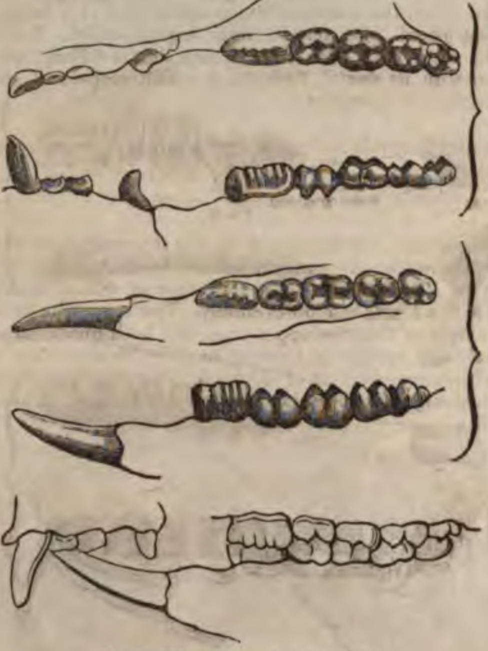
There are old and young stuffed specimens in the British Museum, and a stuffed specimen (Mr. Caley's) in the Museum of the Linnean Society.

The visceral anatomy will be found in Mr. Martin's paper 'On the anatomy of the *Koala*,' read to the Zoological Society in November, 1836 (*Zool Proc.*, 1836). It is chiefly remarkable for the enormous size and length of the cæcum.

Hypsiprymnus. (Illiger.)

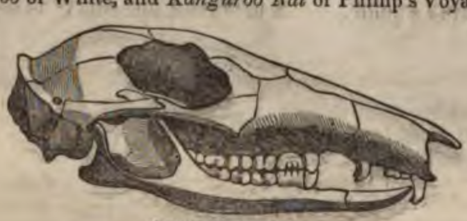
Generic Character.—Head elongated; ears large; upper lip cleft. *Tail* moderate, scaly, covered scantily with hairs. Two teats only in the ventral pouch of the females. Anterior feet five-toed, armed with obtuse nails; third toe of the hind-feet very robust, and armed with a very strong nail.

Dental Formula:—Incisors, $\frac{6}{2}$; canines, $\frac{1-1}{0}$; molars, $\frac{5-5}{5-5} = 30$.



Teeth of Hypsiprymnus. (F. Cuvier.)

Example, *Hypsiprymnus Potoroo* (*Macropus minor* of Shaw; *Potorous minimus* and *Kangurus Gaimardi* of Desmarest; *Hypsiprymnus Whitei* of Quoy and Gaimard; *Potoroo* of White, and *Kanguroo Rat* of Phillip's Voyage).



Skull of Hypsiprymnus.

Description.—Size of a rabbit; general colour grayish, reddish-brown above, whitish below; head triangular, ears large, tarsi very long; tail elongated, flexible, terminated by a pencil of hairs.

Habits and Locality.—The manners of the *Kangaroo Rat* are stated to be mild and timid; its food consists of vegetables, and it is said to burrow in the ground. New Holland is its locality, and Lesson says that it is not rare in the neighbourhood of Port Jackson, especially near the river Weragambia in the Blue Mountains.

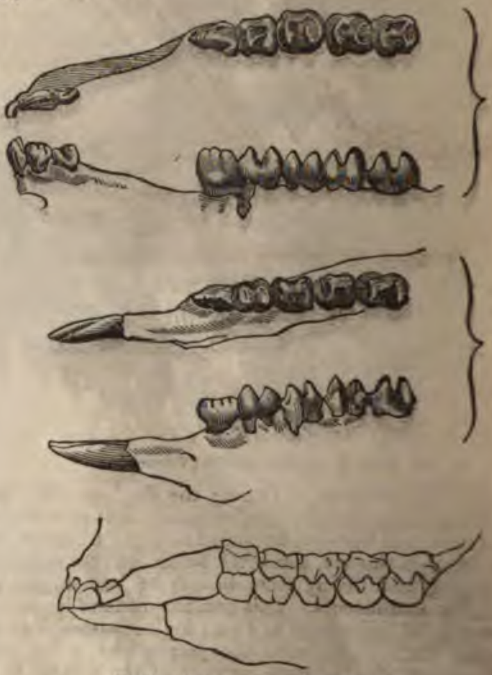
M. Lesson records two other species, and Mr. Ogilby describes (*Zool. Proc.*, 1831) a fourth, *Hypsiprymnus setosus*, known in the colony of New South Wales by the native name of *Bettong Kangaroo*. The specimen described by Mr. Ogilby was believed to have been brought from Swan River. The last-named zoologist has also characteris six other new species. (*Zool. Proc.*, 1838.)

Hypsiprymnus Potoroo (Kangaroo Rat).

Subgenus Halmaturus. (*Illiger* in part.)

Generic Character.—Differing from the true Kangaroo in having shorter ears, a tail nearly naked, or only with few hairs.

Dental Formula:—Incisors, $\frac{6}{2}$; canines, $\frac{0-0}{0-0}$; molar $\frac{5-5}{5-5} = 28$.



Teeth of Halmaturus. (F. Cuvier.)

Example, *Halmaturus elegans* (*Kangurus fasciatus* Péron and Lesueur).

Description.—Colour mouse-gray, bounded transversel with reddish-brown on the back and loins. Size of a larg hare.

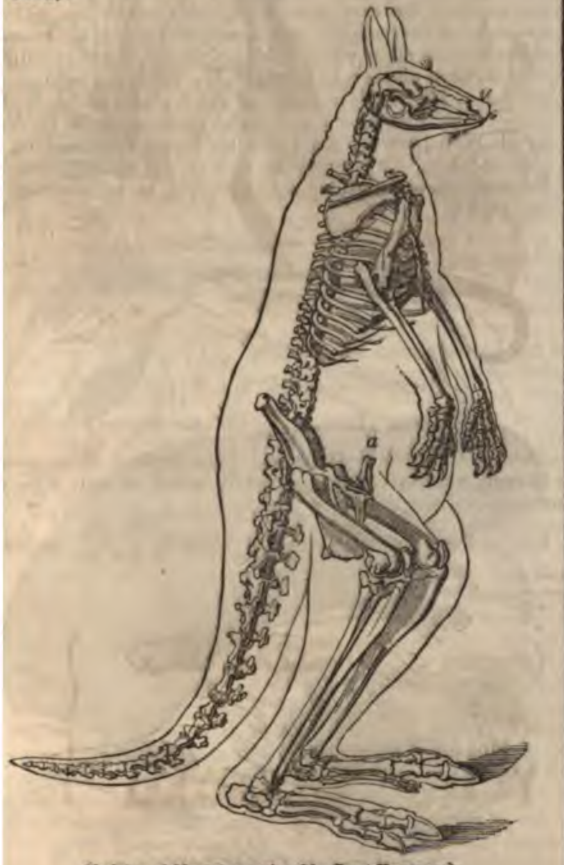
Habits and Locality.—Haunts under thick bushes, an is said to form subterranean galleries in the island of S Pierre.

Subgenus Macropus (*Shaw;* Halmaturus of *Illiger* in part).

Generic Character.—Head elongated; ears very large upper lip cleft; whiskers very short and few. Posterio limbs like those of *Hypsiprymnus*, but much longer an more robust. *Tail* long, triangular, very muscular.

Dental Formula:—Incisors $\frac{6}{2}$; canines $\frac{0-0}{0-0}$; molars $\frac{-4}{-4} = 24$.

Example, *Macropus Major* of Shaw (*Kangurus labiatus* Geoffroy; *Didelphis gigantea* of Gmelin; *The Kangaroo* Cook).



Skeleton of Macropus major (the Great Kangaroo).
a, the marsupial bones.

Macropus major (the Great Kangaroo).

This extraordinary animal, discovered by Captain Cook, is now so well known, that a description, in addition to our illustrations and account of its animal economy at the beginning of this article, would be superfluous. Our countrymen pursued it in New Holland with greyhounds, and the leaps which it took surprised those who beheld it clear obstacles seven or eight feet high. In size it equals a sheep, some of the largest weighing 140 lbs., and the flesh is represented by those who have tasted it as being a little like venison. The species breeds pretty freely in this country, and has been kept with success in our parks.

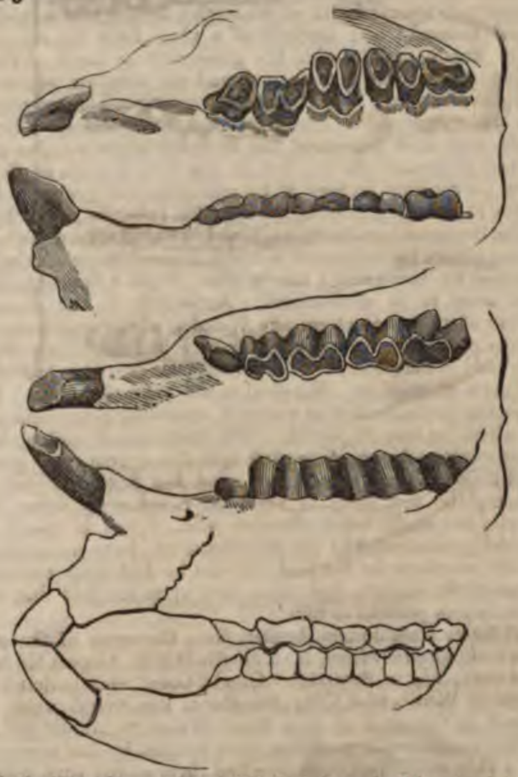
Locality.—New Holland.

There are several other species.

Phascolomys. (Geoffroy.)

Generic Character.—*Body* clumsy. *Head* large and bluff. Fore-*feet* with five toes, armed with crooked nails; hind-feet with four, and a little tubercle without a nail, in place of the great toe; indeed it may be said to have but four toes on the hind-feet. *Tail* nearly null.

Dental Formula:—Incisors $\frac{2}{2}$; canines $\frac{0-0}{0-0}$; molars $\frac{5-5}{5-5} = 24$.



Teeth of Phascolomys, or Wombat (F. Cuvier), nearly of the natural size.

Example.—The only species known is *Phascolomys Wombat* (*Didelphis ursina* of Shaw; *The Wombat* of the natives, navigators, and naturalists).

Description.—From Lieut.-Col. Collins's 'Account of the English Colony of New South Wales' (1802), we select the following part of a description of a *Wombat* found on Cape Barren Island, abstracted from Bass's 'Journal:'—'The *Wombat*, or, as it is called by the natives of Port Jackson, the *Womback*, is a squat, short, thick, short-legged, rather inactive quadruped, with great appearance of stumpy strength, and somewhat bigger than a large turnspit dog. Its figure and movements, if they do not exactly resemble those of the bear, at least strongly remind one of that animal. Its length, from the tip of the tail to the tip of the nose, is thirty-one inches, of which its body takes up twenty-three and five-tenths. The head is seven inches and the tail five-tenths. Its circumference behind the fore-legs twenty-seven inches; across the thickest part of the belly thirty-one inches. Its weight by hand is somewhat between twenty-five and thirty pounds. The hair is coarse, and about one inch or one inch and five-tenths in length, thinly set upon the belly, thicker on the back and head, and thickest upon the loins and rump; the colour of it a light sandy brown of varying shades, but darkest along the back.' The head is large, flattish, and nearly triangular when viewed in front; the ears are sharp and erect; the eyes small and rather sunken than prominent, but quick and lively.

Habits and Locality.—From the same work we take the following account of the habits, &c. of this species:—'This animal has not any claim to swiftness of foot, as most men could run it down. Its pace is hobbling or shuffling, something like the awkward gait of a bear. In disposition it is mild and gentle, as becomes a grass-eater; but it bites hard, and is furious when provoked. Mr. Bass never heard its voice but at that time; it was a low cry between a hissing and a whizzing, which could not be heard at a distance of more than thirty or forty yards. He chased one, and with his hands under his belly suddenly lifted him off the ground without hurting him, and laid him upon his back along his arm like a child. It made no noise, nor any effort to escape, not even a struggle. Its countenance was placid and undisturbed, and it seemed as contented as if it had been nursed by Mr. Bass from its infancy. He carried the beast upwards of a mile, and often shifted him from arm to arm, sometimes laying him upon his shoulder, all of which he took in good part; until, being obliged to secure his legs while he went into the brush to cut a specimen of a new wood, the creature's anger arose with the pinching of the twine; he whizzed with all his might, kicked and scratched most furiously, and snapped off a piece from the elbow of Mr. Bass's jacket with his grass-cutting teeth. Their friendship was here at an end, and the creature remained implacable all the way to the boat, ceasing to kick only when he was exhausted. This circumstance seems to indicate that, with kind treatment, the Wombat might soon be rendered extremely docile; but let his tutor beware of giving him provocation, at least if he should be full grown. Besides Furneaux's Islands, the Wombat inhabits, as has been seen, the mountains to the westward of Port Jackson. In both these places its habitation is under ground, being admirably formed for burrowing; but to what depth it descends does not seem to be ascertained. According to the account given of it by the natives, the Wombat of the mountains is never seen during the day, but lives retired in his hole, feeding only in the night; but that of the islands is seen to feed in all parts of the day. His food is not yet well known; but it seems probable that he varies it, according to the situation in which he may be placed. The stomachs of such as Mr. Bass examined were distended with the coarse wiry grass, and he, as well as others, had seen the animal scratching among the dry ricks of sea-weed thrown up upon the shores, but could never discover what it was in search of. Now the inhabitant of the mountains can have no recourse to the sea-shore for his food, nor can he find there any wiry grass of the islands, but must live upon the food that circumstances present to him.'

A letter from James Hunter, Esq., Governor of the settlement, dated Sydney, New South Wales, August 5, 1798, and published in Bewick's 'Quadrupeds,' states, that this animal, there called *The Wombach*, was found upon an island on the coast of New South Wales, in lat. 40′ 36″ S., where considerable numbers were caught by the company of a ship which had been wrecked there on her voyage from Bengal to Port Jackson. The same communication relates that it had 'lately been discovered to be an inhabitant of the interior of this country also. The mountain natives call it the *Wombach*.'

The specimen dissected by Sir Everard Home in 1808 was brought from one of the islands in Bass's Straits, and lived as a domestic pet in the house of Mr. Clift for two years.

The individual dissected by Mr. Owen in May, 1836, had lived at the Gardens of the Zoological Society upwards of five years.

M. Lesson says that it lives in King Island and the Furneaux Islands, but that it does not exist in the neighbourhood of Port Jackson.

The anatomy of the Wombat will be found in Cuvier's 'Leçons d'Anatomie Comparée,' in Sir Everard Home's paper, 'Phil. Trans.,' 1808, and in Mr. Owen's memoir, 'Zool. Proc.,' 1836. The latter observes that the digestive organs in the abdominal cavity presented a development corresponding generally to that which characterises the same parts in the *phytiphagous Rodents*. It has a very short cæcum.

The flesh of the Wombat is said to be excellent. Mr. Hunter, the writer of the letter above quoted, terms it delicate meat, and some have remarked that the animal might be easily naturalised in this country.

The impression made upon us by Mr. Bass's account of the behaviour of the Wombat which he caught, and by one that we have seen in captivity, is, that the animal is of a low grade in point of intellect. In both cases, as long as there was no positive pain or disagreeable sensation, the animal was content, however new its situation might be. There was none of that anxiety and uneasiness which all animals of lively sense show when suddenly placed in new positions or in strange places; and indeed the following note is appended to Mr. Bass's account of the capture of his Wombat:—'The Kangooroo and some other animals in New South Wales were remarkable for being domesticated as soon as taken.' This may be one of the consequences of the low cerebral development generally to be observed in this group.

Phascolomys Wombat.

FOSSIL MARSUPIALIA.

Besides the Fossil Opossum (*Didelphys Cuvieri*) of the Montmartre Gypsum, figured and described by Cuvier in the 'Annales du Museum,' and in his 'Ossemens Fossiles,' and the fossil *Dasyurus*, *Hypsiprymnus*, *Halmaturus*, *Phascolomys*, and *Kangaroo*, described by Mr. Clift and Cuvier and Mr. Pentland, from the Australian bone-caverns and bone breccia, there are some fossil forms now generally considered as belonging to the Marsupialia, which it will be necessary, on account of the great interest which attaches to them both geologically and zoologically, to mention more at length. We commence with those fossil jaws originally described as belonging to the Marsupialia, which were found at Stonesfield.

Thylacotherium. (Owen.)

In consequence of strong doubts* having been recently expressed by M. de Blainville, *from inspection of casts*, respecting the mammiferous nature of the fossil jaws found at Stonesfield, and assigned to the *Marsupialia* by Baron Cuvier, a paper 'On the Jaws of the *Thylacotherium Prevostii* from Stonesfield' was read before the Geological Society by Richard Owen, Esq., F.R.S., G.S., &c., Hunterian professor in the Royal College of Surgeons, on the 21st of November, 1838, being the first of two memoirs meeting the objections, and giving a detailed account of the fossils from a careful inspection of the originals. In this communication Mr. Owen confined his description to the jaws discovered at Stonesfield, characterised by having eleven molars in each ramus of the lower jaw. He commenced by observing that the scientific world possesses ample experience of the truth and tact with which the illustrious Cuvier formed his judgments of the affinities of an extinct animal from the inspection of a fossil fragment; and that it was only when so distinguished a comparative anatomist as M. de Blainville questioned the determinations, that it became the duty of those who possessed the means to investigate the nature of the doubts, and re-assure the confidence of geologists in their great guide.

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* See 'Comptes Rendus,' 1838.

When Cuvier first hastily examined at Oxford, in 1818, one of the jaws described in Mr. Owen's paper, and in the possession of Dr. Buckland, he decided that it was allied to the Didelphys ('me semblèrent de quelque Didelphe'*); and when doubts were raised by M. Constant Prevost, in 1824,† relative to the age of the Stonesfield slate, Cuvier, from an examination of a drawing made for the express purpose, was confirmed in his former determination; but he added that the jaw differs from that of all known carnivorous Mammalia, in having ten molars in a series in the lower jaw: ('il [the drawing] me confirme dans l'idée que la première inspection m'en avoit donnée. C'est celle d'un petit carnassier dont les mâchelières ressemblent beaucoup à celles des sarigues; mais il y a dix de ces dents en série, nombre que ne montre aucun carnassier connu.' *Oss. Foss.*, v., 349, note.) It is to be regretted that the particular data, with the exception of the number of the teeth, on which Cuvier based his opinion, were not detailed; but he must have been well aware that the grounds of his belief would be obvious, on an inspection of the fossil, to every competent anatomist: it is also to be regretted that he did not assign to the fossil a generic name, and thereby prevent much of the reasoning founded on the supposition that he considered it as belonging to a true Didelphys.

Mr. Owen then proceeded to describe the structure of the jaw; and he stated that having had in his possession two specimens of the *Thylacotherium Prevostii* belonging to Dr. Buckland, he had no hesitation in declaring that their condition is such as to enable any anatomist conversant with the established generalizations in comparative osteology, to pronounce therefrom not only the class but the more restricted group of animals to which they have belonged. The specimens plainly reveal, first, a convex articular condyle; secondly, a well-defined impression of what was once a broad, thin, high, and slightly recurved, triangular, coronoid process, rising immediately anterior to the condyle, having its basis extended over the whole of the interspace between the condyle and the commencement of the molar series, and having a vertical diameter equal to that of the horizontal ramus of the jaw itself: this impression also exhibits traces of the ridge leading forwards from the condyle and the depression above it, which characterises the coronoid process of the zoophagous marsupials; thirdly, the angle of the jaw is continued to the same extent below the condyle as the coronoid process reaches above it, and its apex is continued backwards in the form of a process; fourthly, the parts above described form one continuous portion with the horizontal ramus of the jaw, neither the articular condyle nor the coronoid being distinct pieces, as in reptiles. These are the characters, Mr. Owen believes, on which Cuvier formed his opinion of the nature of the fossil; and they have arrested the attention of M. Valenciennes in his endeavours to dissipate the doubts of M. de Blainville.‡

From the examination of a cast, M. de Blainville however has been induced to infer that there is no trace of a convex condyle, but in place thereof an articular fissure, somewhat as in the jaws of fishes; that the teeth, instead of being embedded in sockets, have their fangs confluent with or anchylosed to the substance of the jaws, and that the jaw itself presents evident traces of the composite structure.

In answer to the first of these positions, Mr. Owen stated that the portion of the true condyle which remains in both the specimens of Thylacotherium examined by Cuvier and M. Valenciennes, clearly shows that the condyle was convex, and not concave. It is situated a little above the level of the grinding surface of the teeth, and projects beyond the vertical line dropped from the extremity of the coronoid process, but not to the same extent as in the true Didelphys. In the specimen examined by M. Valenciennes the condyle corresponds in position with that of the jaw of the Dasyurus rather than the Didelphys: it is convex, as in mammiferous animals, and not concave, as in oviparous. The entire convex condyle exists in the specimen belonging to the other genus, Phascolotherium, now in the British Museum, but formerly in the cabinet of Mr. Broderip. Mr. Owen is of opinion that the entering angle or notch, either above or below the true articular condyle, has been mistaken for 'une sorte d'échancrure articulaire, un peu comme dans les poissons.'

The specimen of the half-jaw of the Thylacothere examined by M. Valenciennes, like that which was transmitted to Cuvier, presents the inner surface to the observer, and exhibits both the orifice of the dental canal and the symphysis in a perfect state. The foramen in the fossil is situated relatively more forward than in the recent Opossum and Dasyure, or in the Placental Insectivora, but has the same place as in the marsupial genus *Hypsiprymnus*. The symphysis is long and narrow, and is continued forward in the same line with the gently convex inferior margin of the jaw, which thus tapers gradually to a pointed anterior extremity, precisely as in the jaws of the Marsupial Insectivora. In the relative length of the symphysis, its form and position, the jaw of the Thylacotherium precisely corresponds with that of the Didelphys.

In addition however to these proofs of the mammiferous nature of the Stonesfield remains, and in part of their having belonged to Marsupialia, Mr. Owen stated that the jaws exhibit a character hitherto unnoticed by the able anatomists who have written respecting them, but which, if co-existent with a convex condyle, would serve to prove the marsupial nature of a fossil, though all the teeth were wanting.

In recent marsupials the angle of the jaw is elongated and bent inwards in the form of a process, varying in shape and development in different genera. In looking therefore directly upon the inferior margin of the marsupial jaw, we see, in place of the edge of a vertical plate of bone, a more or less flattened triangular surface or plate of bone extended between the external ridge and the internal process or inflected angle. In the Opossum this process is triangular and trihedral, and directed inwards with the point slightly curved upwards and extended backwards, in which direction it is more produced in the small than in the large species of Didelphys.

Now, observed Mr. Owen, if the process from the angle of the jaw in the Stonesfield fossil had been simply continued backwards, it would have resembled the jaw of an ordinary placental carnivorous or insectivorous mammal; but in both specimens of Thylacotherium, the half-jaws of which exhibit their inner or mesial surfaces, this process presents a fractured outline, evidently proving that when entire it must have been produced inwards or mesially, as in the Opossum.

Mr. Owen then described in great detail the structure of the teeth, and showed, in reply to M. de Blainville's second objection, that they are not confluent with the jaw, but are separated from it at their base by a layer of matter of a distinct colour from the teeth or the jaw, but evidently of the same nature as the matrix; and secondly, that the teeth cannot be considered as presenting an uniform compressed tricuspid structure, and being all of one kind, as M. de Blainville states, but must be divided into two series as regards their composition. Five if not six of the posterior teeth are quinque-cuspidate, and are *molares veri*; some of the *molares spurii* are tricuspid, and some bicuspid, as in the Opossums. An interesting result of this examination is the observation that the five cusps of the tuberculate molares are not arranged, as had been supposed, in the same line, but in two pairs placed transversely to the axis of the jaw, with the fifth cusp anterior, exactly as in the Didelphys, and totally different from the structure of the molares in any of the Phocæ, to which these very small Mammalia have been compared: and in reference to this comparison Mr. Owen again called attention to the value of the character of the process continued from the angle of the jaw, in the fossils, as strongly contradistinguishing them from the Phocidæ, in none of the species of which is the angle of the jaw so produced. The Thylacotherium differs from the genus Didelphys in the greater number of its molars, and from every ferine quadruped known at the time when Cuvier formed his opinion respecting the nature of the fossil. This difference in the number of the molar teeth, which Cuvier urged as evidence of the generic distinction of the Stonesfield mammiferous fossils.

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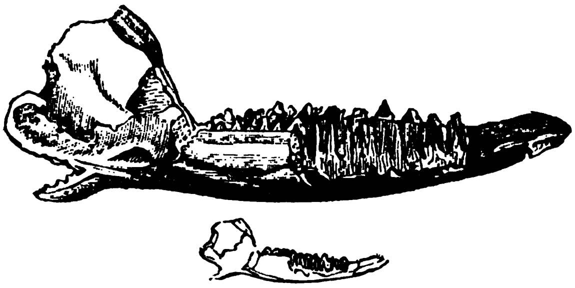
* 'Ossemens Foss.,' tom. v, p. 349.

† 'Annales des Sciences Nat.,' Avril, 1825; also the papers of Mr. Broderip and Dr. Fitton, in the 'Zoological Journal,' 1828, vol. iii., p. 408.

‡ 'Comptes Rendus,' 1838, Second Semestre, No. 11, Sept. 10, p. 537, et seq.

been regarded as one of the proofs of their Saurian nature; but the exceptions by excess to the number seven, assigned by M. de Blainville to the molar teeth in each ramus of the lower jaw of the insectivorous Mammalia, are well established, and have been long known. The insectivorous Chrysochlore, in the order Feræ, has eight molars in each ramus of the lower jaw; the insectivorous Armadillos have not fewer; and in one subgenus (Priodon) there are more than twenty molar teeth on each side of the lower jaw. The dental formulæ of the carnivorous Cetacea, again, demonstrate the fallacy of the argument against the mammiferous character of the Thylacotherium founded upon the number of its molar teeth. From the occurrence of the above exceptions in recent placental Mammalia, the example of a like excess in the number of molar teeth in the marsupial fossil ought rather to have led to the expectation of the discovery of a similar case among existing Marsupials, and such an addition to our zoological catalogues has, in fact, been recently made. In the Australian quadruped described by Mr. Waterhouse under the name of Myrmecobius an approximation towards the dentition of the Thylacotherium is exemplified, not only in the number of the molar teeth, which is nine on each side of the lower jaw in the Myrmecobius, but also in their relative size, structure, and disposition. Lastly, with respect to the dentition, Mr. Owen says it must be obvious to all who inspect the fossil and compare it with the jaw of a small Didelphys, that, contrary to the assertion of M. de Blainville, the teeth and their fangs are arranged with as much regularity in the one as in the other, and that no argument of the Saurian nature of the fossil can be founded on this part of its structure.

With respect to M. de Blainville's assertion that the jaw is compound, Mr. Owen stated that the indication of this structure near the lower margin of the jaw of the Thylacotherium is not a true suture, but a vascular groove similar to that which characterises the lower jaw of Didelphys, Opossum, and some of the large species of Sorex. (*Geol. Proc.*)



Jaw of Thycalotherium Prevostii. Upper figure magnified.

Some discussion having ensued, in which Dr. Grant and Mr. Ogilby expressed opinions in support of M. de Blainville's views, Mr. Owen, on the occasion of reading, on the 9th of December following, his paper on *Phascalotherium*, being the second part of the 'Description of the Remains of Marsupial Mammalia from the Stonesfield slate,' gave a brief summary of the characters of the Thylacotherium, described in the first part of the memoir, and which he conceived fully proved the mammiferous nature of that fossil. He stated that the remains of the split condyles in the specimen demonstrate their original convex form, which is diametrically opposite to that which characterises the same part in all reptiles and all ovipara;—that the size, figure, and position of the coronoid process are such as were never yet witnessed in any except a zoophagous mammal endowed with a temporal muscle sufficiently developed to demand so extensive an attachment for working a powerful carnivorous jaw;—that the teeth, composed of dense ivory with crowns covered with a thick coat of enamel, are everywhere distinct from the substance of the jaw, but have two fangs deeply embedded in it;—that these teeth, which belong to the molar series, are of two kinds; the hinder being bristled with five cusps, four of which are placed in pairs transversely across the crown of the teeth, and the anterior or false molars, having a different form, and only two or three cusps—characters never yet found united in the teeth of any other than a zoophagous mammiferous quadruped;—that the general form of the jaw corresponds with the preceding more essential indications of its mammiferous nature. Fully impressed with the value of these characters, as determining the class to which the fossils belonged, Mr. Owen stated that he had sought in the next place for secondary characters which might reveal the group of Mammalia to which the remains could be assigned, and that he had found in the modification of the angle of the jaw, combined with the form, structure, and proportions of the teeth, sufficient evidence to induce him to believe that the *Thylacotherium* was a marsupial quadruped.

Mr. Owen then recapitulated the objections against the mammiferous nature of the *Thylacotherian* jaws from their supposed imperfect state, and repeated his former assertion that they are in a condition to enable these characters to be fully ascertained: he next reviewed, first the differences of opinion with respect to the actual structure of the jaw; and, secondly, with respect to the interpretation of admitted appearances.

1. As respects the structure.—It has been asserted that the jaws must belong to cold-blooded vertebrata, because the articular surface is in the form of an entering angle: to which Mr. Owen replied, that the articular surface is supported on a convex condyle, which is met with in no other class of vertebrata except in the Mammalia. Again, it is asserted that the teeth are all of an uniform structure, as in certain reptiles; but, on reference to the fossils, Mr. Owen stated that it will be found that such is not the case, and that the actual difference in the structure of the teeth strongly supports the mammiferous theory of the fossils.

2. With respect to the argument founded on an interpretation of structure, which really exists, the author showed that the *Thylacotherium* having eleven molars on each side of the lower jaw is no objection to its mammiferous nature, because among the placental Carnivora the *Canis Megalotis* has constantly one more grinder on each side of the lower jaw than the usual number; because the *Chrysochlore*, among the *Insectivora*, has also eight instead of seven molars in each ramus of the lower jaw; and the *Myrmecobius*, among the Marsupialia, has nine molars on each side of the lower jaw; and because some of the insectivorous *Armadillos* and zoophagous *Cetacea* offer still more numerous and reptile-like teeth, with all the true and essential characters of the mammiferous class. The objection to the false molars, having two fangs, Mr. Owen showed was futile, as the greater number of the spurious molars in every genus of the placental *Feræ* have two fangs, and the whole of them in the Marsupialia. If the ascending ramus in the Stonesfield jaws had been absent, and with it the evidence of their mammiferous nature afforded by the condyloid, coronoid, and angular processes, Mr. Owen stated that he conceived the teeth alone would have given sufficient proof, especially in their double fangs, that the fossils do belong to the highest class of animals.

In reply to the objections founded on the double fangs of the *Basilosaurus*, Mr. Owen said, that the characters of that fossil not having been fully given, it is doubtful to what class the animal belonged; and in answer to the opinion that certain sharks have double fangs, he explained that the widely bifurcate basis supporting the tooth of the shark is no part of the actual tooth, but true bone, and ossified parts of the jaw itself, to which the tooth is anchylosed at one part, and the ligaments of connection attached at the other. The form, depth, and position of the sockets of the teeth in the *Thylacothere* are precisely similar to those in the small Opossums. The colour of the fossils, Mr. Owen said, could be no objection to those acquainted with the diversity in this respect, which obtains in the fossil remains of Mammalia. Lastly, with respect to the *Thylacothere*, the author stated that the only trace of compound structure is a mere vascular groove running along its lower margin, and that a similar structure is present in the corresponding part of the lower jaw of some species of Opossum, of the *Wombat*, of the *Balæna antarctica*, and of the *Myrmecobius*, though the groove does not reach so far forwards in this animal; and that a similar groove is present near the lower margin, but on the outer side of the jaw, in the *Sorex Indicus*.

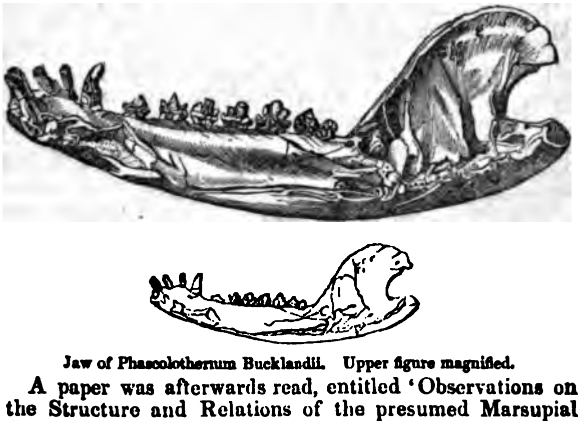
Phascolotherium. (Owen.)

Description of the Half-Jaw of the Phascolotherium.—This fossil is a right ramus of the lower jaw, having its internal or mesial surface exposed. It once formed the chief ornament of the private collection of Mr. Broderip, by whom it has since been liberally presented to the British Museum. It was described and figured by Mr. Broderip (1828, with the provisional name of *Didelphis Bucklandi*) in the 'Zoological Journal, and its distinction from the *Thylacotherium* clearly pointed out. The condyle of the jaw is entire, standing in bold relief, and presents the same form and degree of convexity as in the genera *Didelphys* and *Dasyurus*. In its being on a level with the molar teeth, it corresponds with the marsupial genera *Dasyurus* and *Thylacynus*, as well as with the placental zoophaga. The general form and proportions of the coronoid process closely resemble those in zoophagous Marsupials; but in the depth and form of the entering notch, between the process and the condyle, it corresponds most closely with the *Thylacynus*. Judging from the fractured surface of the inwardly reflected angle, that part had an extended oblique base, similar to the inflected angle of the *Thylacynus*. In the *Phascolotherium* the flattened inferior surface of the jaw, external to the fractured inflected angle, inclines outwards at an obtuse angle with the plane of the ascending ramus, and not at an acute angle, as in the *Thylacyne* and *Dasyurus*; but this difference is not one which approximates the fossil in question to any of the placental zoophaga; on the contrary, it is in the marsupial genus *Phascolomys*, where a precisely similar relation of the inferior flattened base to the elevated plate of the ascending ramus of the jaw is manifested. In the position of the dental foramen the *Phascolothere*, like the *Thylacothere*, differs from all zoophagous Marsupials and the placental *Feræ*; but in the *Hypsiprymnus* and *Phascolomys*, marsupial herbivora, the orifice of the dental canal is situated, as in the Stonesfield fossils, very near the vertical line dropped from the last molar teeth. The form of the symphysis, in the *Phascolothere*, cannot be truly determined; but Mr. Owen stated his opinion that it resembles the symphysis of the *Didelphys* more than that of the *Dasyurus* or *Thylacynus*.

Mr. Owen agrees with Mr. Broderip in assigning four incisors to each ramus of the lower jaw of the *Phascolothere*, as in the *Didelphys*; but in their scattered arrangement they resemble the incisors of the *Myrmecobius*. In the relative extent of the alveolar ridge occupied by the grinders, and in the proportions of the grinders to each other, especially the small size of the hindermost molar, the *Phascolothere* resembles the *Myrmecobius* more than it does the *Opossum*, *Dasyurus*, or *Thylacynus*; but in the form of the crown the molars of the fossil resemble the *Thylacynus* more closely than any other genus of Marsupials. In the number of the grinders the *Phascolothere* resembles the *Opossum* and *Thylacine*, having four true and three false in each maxillary ramus; but the *molares veri* of the fossil differ from those of the *Opossum* and *Thylacothere* in wanting a pointed tubercle on the inner side of the middle large tubercle, and in the same transverse line with it, the place being occupied by a ridge which extends along the inner side of the base of the crown of the true molars, and projects a little beyond the anterior and posterior smaller cusps, giving the quinquecuspid appearance to the crown of the tooth. This ridge, which in *Phascolotherium* represents the inner cusps of the true molars in *Didelphys* and *Thylacotherium*, is wanting in *Thylacynus*, in which the true molars are more simple than in the *Phascolothere*, though hardly less distinguishable from the false molars. In the second true molar of the *Phascolothere* the internal ridge is also obsolete at the base of the middle cusp, and this tooth presents a close resemblance to the corresponding tooth in the *Thylacine*; but in the *Thylacine* the two posterior molars increase in size, while in the *Phascolothere* they progressively diminish, as in the *Myrmecobius*. As the outer sides of the grinders in the jaw of the *Phascolothere* are imbedded in the matrix, we cannot be sure that there is not a smaller cuspidated ridge sloping down towards that side, as in the crowns of the teeth of the *Myrmecobius*. But assuming that all the cusps of the teeth of the *Phascolothere* are exhibited in the fossil, still the crowns of these teeth resemble those of the *Thylacine* more than they do those of any placental *Insectivore* or *Phoca*, if even the form of the jaw permitted a comparison of it with that of any of the Seal tribe. Connecting then the close resemblance which the molar teeth of the *Phascolotherium* bear to those of the *Thylacynus* with the similarities of the ascending ramus of the jaw, Mr. Owen is of opinion that the Stonesfield fossil was nearly allied to *Thylacynus*, and that its position in the marsupial series is between *Thylacynus* and *Didelphys*. With respect to the supposed compound structure of the jaw of the *Phascolotherium*, Mr. Owen is of opinion that, of the two linear impressions which have been mistaken for *harmoniæ*, or toothless sutures, one, a faint shallow linear impression continued from between the antepenultimate and penultimate molars obliquely downwards and backwards to the foramen of the dental artery, is due to the pressure of a small artery, and he stated that he possessed the jaw of a *Didelphys Virginiana* which exhibits a similar groove in the same place. Moreover this groove in the *Phascolothere* does not occupy the same relative position as any of the contiguous margins of the opercular and dentary pieces of a reptile's jaw. The other impression in the jaw of the *Phascolotherium* is a deep groove continued from the anterior extremity of the fractured base of the inflected angle obliquely downwards to the broken surface of the anterior part of the jaw. Whether this line be due to a vascular impression or an accidental fracture is doubtful; but as the lower jaw of the *Wombat* presents an impression in the precisely corresponding situation, and which is undoubtedly due to the presence of an artery, Mr. Owen conceives that this impression is also natural in the *Phascolothere*, but equally unconnected with a compound structure of the jaw; for there is not any suture in the compound jaw of a reptile which occupies a corresponding situation.

The most numerous, the most characteristic, and the best-marked sutures in the compound jaws of a reptile are those which define the limits of the coronoid, articular, angular, and surangular pieces, and which are chiefly conspicuous on the inner side of the posterior part of the jaw. Now the corresponding surface of the jaw of the *Phascolothere* is entire; yet the smallest trace of sutures, or of any indication that the coronoid or articular processes were distinct pieces, cannot be detected; these processes are clearly and indisputably continuous, and confluent with the rest of the ramus of the jaw. So that where sutures ought to be visible, if the jaw of the *Phascolothere* were composite, there are none; and the hypothetical sutures that are apparent do not agree in position with any of the real sutures of an oviparous compound jaw.

Lastly, with reference to the philosophy of pronouncing judgment on the Saurian nature of the Stonesfield fossils from the appearance of sutures, Mr. Owen offered one remark, the justness of which, he said, would be obvious alike to those who were and to those who were not conversant with comparative anatomy. The accumulative evidence of the true nature of the Stonesfield fossils, afforded by the shape of the condyle, coronoid process, angle of the jaw, different kinds of teeth, shape of their crowns, double fangs, implantation in sockets,—the appearance, he repeated, presented by these important particulars cannot be due to accident; while those which favour the evidence of the compound structure of the jaw may arise from accidental circumstances. (*Geol. Proc.*, 1838-39, vol. iii.)



Jaw of Phascolotherium Bucklandii. Upper figure magnified.

A paper was afterwards read, entitled 'Observations on the Structure and Relations of the presumed Marsupial Remains from the Stonesfield oolite,' by William Ogilby, Esq., F.G.S.

These observations were intended by the author to embody only the most prominent characters of the fossils, and those essential points of structure in which they are necessarily related to the class of mammifers or of reptiles respectively. For the sake of putting the several points clearly and impartially, he arranged his observations under the two following heads:—

1. The relations of agreement which subsist between the fossils in question and the corresponding bones of recent Marsupials and Insectivora.

2. The characters in which the fossils differ from those families. Mr. Ogilby confined his remarks to Marsupialia and Insectivora, because it is to those families only of Mammifers that the fossils have been considered by anatomists to belong; and to the interior surface of the jaw, as the exterior is not exhibited in any of the fossil specimens.

1. In the general outline of the jaws, more especially in that of the *Didelphys* (*Phascolotherium*) *Bucklandii*, the author stated that there is a very close resemblance to the jaw in recent Insectivora and insectivorous Marsupials; but he observed that with respect to the uniform curvature along the inferior margin, Cuvier has adduced the same structure as distinctive of the Monitors, Iguanas, and other true Saurian reptiles; so that whatever support these modifications of structure may give to the question respecting the marsupial nature of the Stonesfield fossils, as compared with other groups of Mammals, they do not affect the previous question of their mammiferous nature, as compared with reptiles and fishes. The fossil jaws, Mr. Ogilby said, agree with those of Mammals, and differ from those of all recent reptiles, in not being prolonged backward behind the articulating condyle; a character, in conjunction with the former relation, which would be, in this author's opinion, well-nigh incontrovertible, if it were absolutely exclusive; but the extinct Saurians, the *Pterodactyles*, *Ichthyosauri*, and *Plesiosauri*, cotemporaries of the Stonesfield fossils, differ from their recent congeners in this respect, and agree with Mammals. Mr. Ogilby is of opinion that the condyle is round both in *D. Prevostii* and *D. Bucklandii*, and is therefore a very strong point in favour of the mammiferous nature of the jaws. The angular process, he said, is distinct in one specimen of *D. Prevostii*, and, though broken off in the other, has left a well-defined impression; but that it agrees in position with the Insectivora, and not the Marsupialia, being situated in the plane passing through the coronoid process and the ramus of the jaw. In the *D. Bucklandii*, he conceived, the process is entirely wanting; but that there is a slight longitudinal ridge partially broken, which might be mistaken for it, though placed at a considerable distance up the jaw, or nearly on a level with the condyle, and not at the inferior angular rim of the jaw. He is therefore of opinion that the *D. Bucklandii* cannot be properly associated either with the Marsupial or Insectivorous Mammals. The composition of the teeth, he conceives, cannot be advanced successfully against the mammiferous nature of the fossils, because animal matter preponderates over mineral in the teeth of the great majority of the Insectivorous *Cheiroptera*, as well as in those of the *Myrmecobius* and other small Marsupials. In the jaw of the *D. Prevostii* Mr. Ogilby cannot perceive any appearance of a dentary canal, the fangs of the teeth, in his opinion, almost reaching the inferior margin of the jaw, and being implanted completely in the bone; but in the *D. Bucklandii* he has observed, towards the anterior extremity of the jaw, a hollow space filled with foreign matter, and very like a dentary canal. The double fangs of the teeth of *D. Prevostii*, and probably of *D. Bucklandii*, he said, are strong points of agreement between the fossils and mammifers in general; but that double roots necessarily indicate, not the mammiferous nature of the animal, but the compound form of the crowns of the teeth.

2. With respect to the most prominent characters by which the Stonesfield fossils are distinguished from recent mammals of the insectivorous and marsupial families, Mr. Ogilby mentioned, first, the position of the condyle, which is placed in the fossil jaws in a line rather below the level of the crowns of the teeth; and he stated that the condyle not being elevated above the line in the *Dasyurus Ursinus* and *Thylacinus Harrisii*, is not a valid argument, because those Marsupials are carnivorous. The second point urged by the author against the opinion that the fossils belonged to insectivorous or marsupial mammifers, is in the nature and arrangement of the teeth. The number of the molars, he conceives, is a secondary consideration; but he is convinced that they cannot be separated in the fossil jaws into true and false, as in Mammalia; the great length of the fangs, equal to at least three times the depth of the crowns, he conceives, is a strong objection to the fossils being placed in that class, as it is a character altogether peculiar and unexampled among mammals; the form of the teeth also, he stated, cannot be justly compared to that of any known species of marsupial or insectivorous mammifer, being, in the author's opinion, simply tricuspid, and without any appearance of interior lobes. As to the canines and incisors, Mr. Ogilby said that the tooth in *D. Bucklandii*, which has been called a canine, is not larger than some of the presumed incisors, and that all of them are so widely separated as to occupy full five-twelfths of the entire dental line, whilst in the *Dasyurus viverrinus* and other species of insectivorous Marsupials they occupy one-fifth part of the same space. Their being arranged longitudinally in the same line with the molars, he conceives, is another objection, because, among all mammals, the incisors occupy the front of the jaw, and stand at right angles to the line of the molars. With respect to the supposed compound structure of the jaw, Mr. Ogilby offered no formal opinion, but contented himself with simply stating the appearances: he nevertheless objected to the grooves being considered the impression of blood-vessels, though he admitted that the form of the jaws is altogether different from that of any known reptile or fish.

From a due consideration of the whole of the evidence, Mr. Ogilby stated, in conclusion, that the fossils present so many important and distinctive characters in common with mammals on the one hand, and cold-blooded animals on the other, that he does not think naturalists are justified at present in pronouncing definitively to which class the fossils really belong. (*Geol. Proc.*, 1838-39, vol. iii.)

On the 9th of January, 1839, Mr. Owen proved, in a paper read to the Geological Society, that the so-called *Basilosaurus* of Dr. Harlan, upon which M. de Blainville and the other objectors, thinking it to be a fossil reptile with double-fanged teeth, had relied so strongly as an argument for the non-mammiferous nature of the Stonesfield jaws, is no Saurian at all, but a mammiferous animal forming a most interesting link between the carnivorous and herbivorous *Cetacea;* and in compliance with the suggestion of Dr. Harlan, who, having compared with Mr. Owen the microscopic structure of the teeth of the *Basilosaurus* with those of the *Dugong* and other animals, admitted the correctness of the inference of its mammiferous nature,—Mr. Owen proposed to substitute for the name of *Basilosaurus* that of *Zeuglodon*. [Whales.]

Among the fossil remains collected by Sir Thomas Livingstone Mitchell, in the caves of Wellington Valley, Australia, and which are now deposited in the museum of the Geological Society of London, Professor Owen describes the following genera and species:—

Macropus.

Macropus Atlas, at least one-third larger than the *Macropus major*, the largest known existing species of Kanguroo, approaching in the great size of its permanent spurious molar to *Hypsiprymnus*.

Macropus Titan, as large as the preceding, but differing chiefly in the smaller size of the permanent spurious molar, which in this respect more nearly corresponds with the existing *Macropus major*.

Hypsiprymnus.

An undetermined species, rather larger than any of the three species with whose crania Mr. Owen has had the opportunity of comparing them. There is no evidence, according to him, that it agrees with any existing species.

Phalangista.

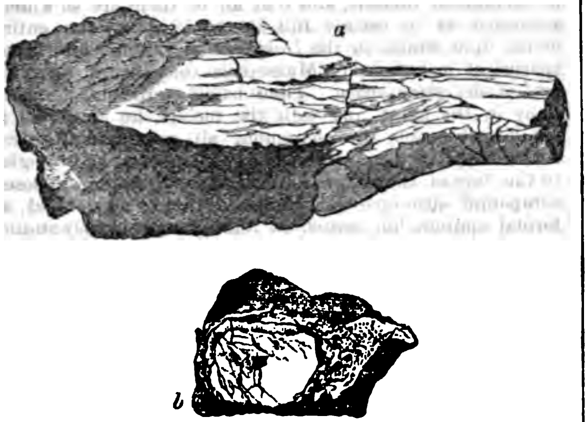
A species differing from *Phalangista Vulpina* in having the spurious molar of relatively smaller size, and the second molar narrower; the symphysis of the lower jaw is also one line deeper in the fossil. Mr. Owen states that there is no proof that it corresponds with any existing species; but, he adds, that a comparison of the fossils with the bones of these species (which are much wanted in our osteological collections) is obviously necessary to establish the important fact of the specific difference or otherwise of the extinct Phalanger.

Phascolomys.

Phasolomys Mitchellii, a little larger, probably, than the existing Wombat.

Diprotodon. (N. G. Owen.)

Mr. Owen applies this name to the genus of *Mammalia* represented by the anterior extremity of the right ramus of the lower jaw, with a single large procumbent incisor, of which we give a reduced figure below (*a*, *b*). It had been formerly conjectured to belong to the Dugong, but the incisor resembles the corresponding tooth of the Wombat in its enamelled structure and position (*b*), and the section of the Wombat's teeth. It differs however in the quadrilateral figure of its transverse section, in which it corresponds with the inferior incisors of the Hippopotamus.



Anterior extremity of the right ramus, lower jaw, of Diprotodon. *a*, profile. (Owen.)

Dasyurus.

Dasyurus laniarius, closely resembling *Dasyurus Ursinus*, but differing from it in being one-third larger, and in having the canines or laniaries of proportionately larger size. Another specimen leads Mr. Owen to doubt whether it is the lower jaw of the *Dasyurus laniarius*, or of some extinct marsupial carnivore of an allied but distinct species.

The general result of the examination of the remains found in the Wellington Valley bone-caves are,—1st. That the fossils are not referrible to any known extra-Australian genus of mammals. 2nd. That the fossils are not referrible, from the present evidence, to any existing species of Australian mammal. 3rd. That the greater number certainly belong to species either extinct or not yet discovered living in Australia. 4th. That the extinct species of *Macropus*, *Dasyurus*, and *Phascolomys*, especially *Macropi Atlas* and *Titan*, are larger than the largest known existing species. 5th. That the remains of the saltatory animals, as the *Macropi* and *Hypsiprymni*, are all of young individuals; while those of the burrowing Wombat, the climbing Phalanger, and the ambulatory Dasyure, are the remains of adults. (Owen, in Mitchell's *Three Expeditions into the Interior of Eastern Australia*, &c.)

Dr. Buckland observes, that the discovery of the *Marsupialia*, both in the secondary and tertiary formations, shows that this order, so far from being of more recent introduction than other orders of Mammalia, is in reality the first and most antient condition under which animals of this class appeared upon our planet;—that, as far as we know, it was their only form during the secondary period;—that it was co-existent with many other orders in the early parts of the tertiary period; and that its geographical distribution in the present creation is limited to North and South America, and to New Holland, with the adjacent islands. (*Bridgewater Treatise*.)

MARSUPIOCRINITES, a genus of Crinoidea, recently proposed by Professor Phillips for some remarkable fossils noticed by Mr. Murchison in the strata of the Silurian system. (*The Silurian System*, pl. 18, f. 3.) The arms are formed of two rows of calcareous plates.

MARSUPIOCRINITES. [Encrinities, vol. ix., p. 393.]

MARSUPITES, a fossil genus of *Echinodermata*, established by Miller in his work on the Crinoidea. In many respects it resembles the Crinoidea, but has no stem. [Encrinites, vol. ix., p. 393.] It belongs to the chalk.

MARTABAN. [Tenasserim.]

MARTEL, CHARLES. [Charles Martel.]

MARTELLO TOWER, a circular building of masonry, generally two stories high; the lower story is divided into chambers for the reception of stores, and the upper serves as a casemate for troops: the roofs are vaulted, and that of the upper story is shell-proof. The wall of the building terminates above in a parapet; and, on the terreplein of the roof, are placed pieces of artillery which rest on platforms of timber traversing on pivots, so that the guns are capable of being fired in any direction. The entrances are at a considerable height above the ground, and over these are machicolations. The whole work is generally surrounded by a ditch and glacis.

It is probable that the name of such works should be Mortella Towers, since it is supposed to have been derived from that of a fort in Mortella (Myrtle) Bay, Corsica, which after a gallant resistance was taken in 1794 by a British naval force. Several such towers were, during the late war, built on the coasts of this country, in Jersey, and elsewhere; but most of them have, since the peace, been taken down, from an opinion that the defence which could be made from them, in the event of an invasion, would not be adequate to the expense of keeping them in repair.

MARTEN, or MARTIN (Mammalogy), the name of a carnivorous quadruped (*Mustela Martes*, Linn.), of the Weasel family. [Weasel.]

MARTHA'S VINEYARD. [Massachusetts.]

MARTIAL LAW is a series of regulations made to preserve order and discipline in the army, and enforced by the prompt decisions of courts-martial; this is generally however called military law. During the existence of a rebellion, when, in consequence of the ordinary processes of general law becoming ineffectual for the security of life and property in any province or state, the legislature has appointed that a military force shall be employed to suppress the disorders and secure the offenders—and when the trial of the latter takes place according to the practice of military courts, that province or state is said to be subject to martial law.

On the occurrence of such a calamity in any part of the British dominions, the two houses of parliament, jointly with the crown, determine that a temporary suspension of the Habeas Corpus Act shall take place. This measure is, of course, adopted only in cases of great emergency, on account of the abuses to which it may give rise; and the necessity of it and the time of its duration are always stated in the provisions of the decree. The act by which martial law was declared in Ireland during the Rebellion in 1798 may be seen in Tytler's *Essay on Military Law*, Appendix, No. 6.

In merely local tumults the military commander is called upon to act with his troops only when the civil authorities have failed in preserving peace; and the responsibility of employing soldiers on such occasions falls entirely upon the magistrate. The military officer must then effect by force what by other means could not be effected; and, for the consequences, the officer can be answerable only to a military court or to the parliament of the nation.

The constitution of this country permits a military law for the government of the army, even in times of internal tranquillity, to co-exist with the general law of the land. But the former applies to military persons only; among these its jurisdiction comprehends all matters relating to the discipline of the army, to the cognizance of which the civil courts are not competent—as disobedience of orders, cowardice, &c.; and extends to such crimes as desertion, mutiny, and holding correspondence with the enemy. On the other hand, every citizen who is not engaged in the military profession is subject to the general laws of the land alone, and is free from all the restraints which, by the necessity of preserving discipline, are imposed on the soldier: he is his own master, he can dispose of his time at pleasure, and the peculiar regulations of the military service are, to him, as though they did not exist.

This distinction between the two classes of persons with respect to military law is clearly expressed in the 'Mutiny Act,' as it is called, which was first passed in the reign of William III. It is there stated that the subjects of this realm cannot be punished in any other manner than conformably to the common laws of the country. But an exception is immediately made in the case of military persons; and there follow several enactments for the purpose of bringing soldiers who shall mutiny, excite sedition, or desert from the service, to a more exemplary and speedy punishment than the usual forms of law will allow.

Immediately after the Norman conquest of this country the military law consisted in the obligation imposed on the vassals of the crown to follow the king to the field, under penalty of a pecuniary fine or the forfeiture of their land. But the first known record concerning the regulation of the army is believed to be that which was made in the reign of King John; and this relates chiefly to the purchase of provisions at the sales held for supplying the army with necessaries. The ordonnances of Richard II. and of

Henry V., and the statutes of Henry VIII., contain many useful rules for the government and discipline of the army. They prescribe obedience to the king and the commanders; they award punishments for gaming, theft, and other crimes; for raising false alarms in the camp, and for the seizure of religious persons. They also contain regulations concerning the disposal of prisoners taken in battle, and concerning the stakes, fascines, ladders, and other materials for military operations, with which the soldiers were to provide themselves. (*Grose*, vol. ii.)

The early kings of this country do not appear to have exercised, generally, a discretionary power over the army; for a statute of Edward I. states that the king had power to punish soldiers only according to the laws of the realm. The court of high constable and high marshal of England had for many years an exclusive jurisdiction in all military affairs, and this was sometimes extended over the civil courts. But the power of that court was restrained by a statute in the reign of Richard II. (1386), and it subsequently expired. From the time of Henry VII. till the reign of Charles I. the enactment of laws for the government of the army depended on the king alone.

The excesses which, during the last-mentioned reign, were committed by the undisciplined army which that ill-advised prince quartered on such of the people as had refused to lend money to the crown for raising them, led to the promulgation of a martial law, by which power was given to the magistrates to arrest and execute the persons guilty of murders, robberies, and other crimes, as in time of war. The *petition of right* abolished martial law for a time in this country, but it was subsequently restored by the parliament, and several ordinances of great severity were during the interregnum enacted respecting the maintenance of discipline. In the beginning of the reign of James II., after the rebellion of the Duke of Monmouth, several executions took place by martial law; and this may be said to have been the last occasion on which the law was exercised in Great Britain. At the time of the Revolution the present regular code was established for the government of the army; and this, under the name of the 'Mutiny Act,' has ever since been annually renewed by parliament.

(Grose, *Military Antiquities*; Tytler's *Essay on Military Law*, by Charles James; Samuel, *Historical Account of the British Army*; Major Adye, *Treatise on Military Law*; Major-General C. J. Napier, *Remarks on Military Law*. See also COURTS-MARTIAL.)

MARTIA'LIS, MARCUS VALE'RIUS, was a native of Bilbilis [BILBILIS], in Spain, where he was born on the Calends of March, about the year 40 A.D. Very few particulars of his life are ascertained, and even these are principally collected from his own writings. He came to Rome at an early age, and passed about thirty-five years of his life in that city. He left Rome probably about the commencement of Trajan's reign, and retired to his native town. The emperor Titus appears to have been his first imperial patron. Domitian, the successor of Titus, gave him the 'jus trium liberorum,' and conferred on him the dignity of tribune (*Epig.* ii. 91; iii. 95), for which and other favours the grateful poet made a most abundant return of flattery. Some critics have supposed that the author was married, and had a wife Marcella (xii., 21, 31); but the conclusion to be drawn from his writings is on the whole the other way. Martial was acquainted with most of his literary contemporaries, Juvenal, Quintilian, Pliny the younger, and others, as appears from his own writings (ii., 90; xii., 18, &c.).

There are extant of Martial fourteen books, entitled 'Epigrammata,' of which the thirteenth also bears the particular name of Xenia, and the fourteenth that of Apophoreta. A book called 'Spectaculorum Liber,' which is prefixed to the 'Epigrams,' contains a number of small poems on the shows of Titus and Domitian, and, as some critics suppose, may not be altogether the work of Martial. The whole collection contains above 1500 epigrams.

Many of the epigrams of Martial belong to that class of compositions which are now known by the name of epigrams, and may be considered as the prototype of that species of composition: they are short pieces, varying in length from two lines to four, six, or more, the point of which is generally contained in the last line. Like modern compositions of this kind, the thought is often forced and laboured, and the whole meaning sometimes obscure. Other of his compositions belong to that class more properly called epigrams [EPIGRAM], according to the original signification of the word, and are often characterized by great felicity of expression: they are on a great variety of subjects, and contain much matter that needs and requires comment. There is perhaps no Roman writer extant whose works, if well studied, would be so useful as Martial in illustrating the period in which he lived. Martial's description of his native Bilbilis and the river Salo (Xalon) which flows by it, and several other pieces, show a taste for a country life, and a poetic vein hardly inferior to that of Horace (i. 50, &c.). The twelfth book of his 'Epigrams' was published after his return to Bilbilis (xii. 3).

Many of the epigrams of Martial are as gross and obscene as thought and expression can make them; as to which it may be sufficient to remark that the manners of his age did not forbid the publication of obscene poetry, and that in this respect Martial was no worse than many of his contemporaries. In the Delphin edition the most obscene epigrams have been carefully selected and placed together at the end of the work, for reasons which, as there given, do not appear very satisfactory.

The editions and translations of Martial are very numerous. There are several English translations, the latest of which, so far as we know, is that by James Elphinstone, London, 1782.

MARTIGUES, LES, a town in France in the department of Bouches du Rhône, on the channel which forms the communication between the étang or lake of Martigues, or Berre, and the sea. It consists of three parts communicating with each other by bridges: the most antient part, called the Isle, is on an island in the mid channel; the other two, called Jonquières and Ferrières, are on the south-east and north-west banks respectively. The streets are generally well laid out and the houses neatly built. The banks of the channel are lined with quays. There are a spacious and regularly built town-hall and a handsome church. The population in 1831 was 5335 for the town, or 7379 for the whole commune; the inhabitants are engaged as seamen, or in the manufacture of hats, in ship-building, and in the fishery on the lake. They export oil, wine, salt, and a great quantity of fish. The fish of the Mediterranean resort periodically to the lake, where the greater part are taken by the fishermen.

MARTIN (Ornithology), the name for some of the Swallow tribe, as the *House Martin* (*Hirundo urbica*, Linn.), the *Bank* or *Sand Martin* (*Hirundo riparia*), and the *Black Martin* or *Swift*. [SWALLOWS.]

MARTIN I., a Tuscan by birth, succeeded Theodore I. in the see of Rome, A.D. 649. He held a council of Italian bishops in the Lateran church, in which the Monothelites were condemned. The emperor Constans II., who favoured the Monothelites, gave orders to the exarch of Ravenna to seize the person of the pope. Martin was taken to Constantinople, where a judicial inquiry was instituted against him for disobedience to the emperor, and he was banished to the Thracian Chersonesus, where he died in 655. He was succeeded by Eugenius I.

MARTIN II., called by some Marinus I., succeeded John VIII. in 882, and died in 884. He was succeeded by Adrian III.

MARTIN III., called by some Marinus II., a Roman by birth, succeeded Stephen VIII. in 942. He died in 946, and was succeeded by Agapitus II.

MARTIN IV., cardinal Simon de Brie, a native of France, succeeded Nicholas III. in the papal chair in 1281, through the influence of Charles of Anjou, king of Sicily and Naples. The Sicilian Vespers in 1282 having deprived Charles of Sicily, Martin excommunicated Peter of Aragon, whom the Sicilians had elected king, but his excommunication was of no more avail than the arms of the Angevins, for the Sicilians stood firm against both. Martin excommunicated the Byzantine emperor Michael, by which he widened the breach between the Greek and Latin churches. He died in 1285, and was succeeded by Honorius IV.

MARTIN V., Cardinal Otho Colonna, of an illustrious Roman family, was chosen by the council of Constance, after the deposition of John XXIII. and of the two antipopes Gregory and Benedict. Martin closed the council of Constance, in April, 1417, without its having effected the reforms in the church which were expected from it by Europe in general. Martin however promised to call together a new council for the purpose, which after much delay met first at Siena and afterwards at Basle in Switzerland, whither the pope sent his legate, cardinal Julian Cesarini, in 1431. But Martin died soon after, and was succeeded by Eugenius IV.

MARTIN-DE-RE′, ST. [CHARENTE INFERIEURE.]

MARTIN, SAINT, one of the Lesser Antilles, lies to the south of Anguilla, from which island it is separated by a deep channel, about four miles wide in the narrowest part. Saint Martin is about 12 miles long and of a very irregular shape; its area is about 90 square miles. It contains no mountains, but a great number of rocky hills. The soil of the valleys and plains is sandy, and not very productive; there are no rivers or running streams on the island. The little rain which falls is collected into cisterns. The produce consists of sugar, cotton, and tobacco. The island also contains some valuable salt-ponds.

Saint Martin was originally settled by Spaniards, soon after the discovery of the West Indies by Columbus, but they abandoned the island in the middle of the seventeenth century. After this it was held jointly by the French and the Dutch, the former taking the northern and the latter the southern half, which is the most valuable, from its containing the salt-ponds. In March, 1801, the island was taken by the English, but at the peace of Paris was given up wholly to the Dutch, who have since retained possession of it. Philisburg, the town, is on the south-west side, in 18° 1′ N. lat. and 63° 7′ W. long.; it has a commodious harbour with from 8 to 10 fathoms water.

MARTI′NI, GIAMBATTISTA, well known throughout Europe under the title of the Padre Martini, was born at Bologna in 1706. Early in youth he entered the order of St. Francis, and, prompted by a spirit of inquiry and love of antiquity, soon set out on travels which he extended to Asia, on his return from which he seriously recommenced the study of music, under the celebrated Ant. Perti. In 1723 he became Maestro di Capella of the convent of his order, which office he retained till his death. 'He was,' says Dr. Burney, who knew him well, 'regarded during the last fifty years of his life as the most profound harmonist, and the best acquainted with the art and science of music, in Italy. All the great masters of his time were ambitious of becoming his disciples, and proud of his approbation.' He was also a composer, and produced much music for the church, which was formerly held in esteem. His sixty Canons in the unison, for 2, 3, and 4 voices, are still known, and admired for their smoothness and grace. But the reputation of the excellent and learned Father is built, and durably, on his Essay on Counterpoint, published, in two folio volumes, at Bologna, in 1774; and on his History of Music, in three volumes, quarto, the last of which appeared in 1781.

Martini's Essay (*Saggio fondamentale practico di Contrappunto sopra il Canto-Fermo*) is divided into two parts. In the first is a compendium of the rules of counterpoint, explaining clearly, and well illustrating, the laws of harmony. This is followed by the application of the foregoing to *Canto-Fermo* [PLAIN-CHANT], and succeeded by upwards of sixty compositions by the great masters of the antient Italian school. The second part is wholly devoted to fugue and canon, and is extremely recondite, containing, however, too many musical enigmas and other matters which, happily, have no value in the present day: but compensation is made, for what now can only be considered as laborious trifling, by nearly fifty specimens of composition, in from two to eight parts, by several of the most distinguished of the old Italian masters.

The History (*Storia della Musica*) by Martini was intended to be most voluminous, it is to be presumed, for the third volume only reaches the time of Alexander the Great. What is completed exhibits vast erudition and astonishing research, but is grievously defective in plan; and though valuable as a work of reference, will now be read chiefly by the studious professor and the patient antiquary, who may derive from it much curious and useful information. The materials collected by the author for his purpose were of surprising extent; the number of volumes in his library amounted, we are told, to seventeen thousand, of which three hundred were manuscripts of great rarity; and a large part of all this he was enabled to purchase and obtain through the generosity and interest of Farinelli, the famous singer, whose numerous acts of liberality and benevolence proved that he was able to repress his resentment against mankind for having sanctioned the cruel practices under which he had suffered. Martini died in 1784.

MARTINI, GIUSEPPE SAN, a composer of distinguished merit, and a most celebrated performer on the oboe—an instrument which he may be said to have civilised—was a native of Milan, and arrived in England in 1723. He was soon engaged at all the public and private concerts, and in 1740 was taken into the service of the Prince of Wales, and received the appointment of music-master to the princesses. His Twelve Sonatas for two violins and violoncello were long in the highest favour with the public; but his best work is his Concertos for a full band, which display great invention, very elegant taste, and a thorough knowledge of his art. He died in 1750.

MARTINI, VINCENZO, commonly known as Martini of Madrid, was born at Valencia in Spain, about the year 1750. He was Maestro di Capella to the prince of Asturias, in 1785, and has always been thought one of the most agreeable composers of Italian operas. Among his works are *L'Arbore di Diana*, brought out at Vienna in 1787, and *La Cosa Rara*, produced about the same time, both of which have been everywhere popular, particularly the latter, which is well known on our English as well as on the Italian stages, Stephen Storace having introduced most of it in Cobb's opera, the *Siege of Belgrade*.

MARTINIQUE, or MARTINICO, one of the largest of the Caribee Islands, is 10 leagues south-south-east of Dominica. The greatest length is 50 miles from north-west to south-east, and the mean breadth is about 16 miles; in form it is very irregular, and its surface is very uneven, being generally occupied by conical shaped hills. Three mountains of considerable height are visible on approaching the island in any direction; one of these, Mont Pelée, on the north-west side, is an exhausted volcano; the summits of the three are mostly covered with clouds. The island contains a great number of streams, and the coast, being indented by numerous bays and inlets, affords many good harbours. There are two principal towns, Saint Pierre and Port Royal, both on the west side of the island; the former is in 14° 44′ N. lat. and 61° 14′ W. long., and the latter in 14° 35′ N. lat. and 61° 7′ W. long. Port Royal, the residence of the governor, stands on the north side of a deep and well sheltered bay, protected by a fort which covers the whole surface of a peninsula and commands the town and harbour. During the war and while Martinique was in possession of the English, Port Royal was the general rendezvous and head-quarters of the fleet stationed in the West Indies. The Diamond Rock, which is about three leagues south-south-east from Port Royal bay, was taken possession of by the English between the breaking out of the war in 1802 and the capture of the island in 1810, and was commissioned and rated as a sloop of war in the British navy. Saint Pierre is an open roadstead, affording very indifferent shelter to shipping, but it is the principal place of trade in the island, and is said to be the handsomest town in the West Indies. It consists of three spacious streets parallel to the beach, and several transverse streets. Streams of water are conveyed through the principal streets, and impart a degree of freshness to the air most desirable in so warm a climate.

The population of the island in 1834 consisted of 36,766 whites and free coloured persons, and 78,233 slaves: together 114,999.

The staple production of the island is sugar, of which it yielded in 1834, 28,692 tons, besides 8748 tons of molasses and 365,600 gallons of rum. There were also grown about 600 tons of coffee, and small quantities of cotton, cocoa, and cloves. The total value of the imports in that year was 588,000*l.*, and of the exports 647,500*l.* The number and tonnage of ships that arrived and sailed were—

	Vessels.	Tons.
Arrived—French ships . .	375	50,121
„ Foreign ships .	442	tonnage not stated.
Sailed—French ships . .	371	48,063
„ Foreign ships .	444	tonnage not stated.

The foreign vessels were chiefly craft from the neighbouring English colonies; the rest were Americans.

Martinique was first settled by a party of about 100 men headed by a French planter, M. Desnambre, from St. Christopher, in 1635. The island was at that time peopled by Caribs, but in the course of a very few years they were exterminated. It was taken in 1762 by the English, but was restored at the peace in the following year. In 1794 it was again taken by the English, and again restored to France at the peace of Amiens. It was once more cap tured by the English in 1810, and finally restored by the treaty of Paris in 1814, since which time it has remained under the dominion of France. At the beginning of the present year (1839) the island suffered the shock of an earthquake, which did considerable damage to the town of St. Pierre, and almost wholly destroyed Port Royal, in which town upwards of 500 persons were killed by the falling of the buildings, including nearly all the inmates of the principal hospital. The works and the negro villages of many of the sugar plantations were destroyed by the same shock.

MARTLET. [Heraldry.]

MARTOS, IVAN PETROVITCH, director of the Academy of Fine Arts, St. Petersburg, was not only the most eminent sculptor Russia has yet produced (and she has given birth to a Prokophiev and a Kozlovsky), but one who would have ranked high in almost any age or country. The number of his works is very considerable, and among the more important are the following public monuments:—the bronze colossal group of the patriot Minin and Pozharsky, at Moscow; the monument to the emperor Alexander, at Taganrog; the statue of the duke of Richelieu, at Odessa; Potemkin's monument, at Cherson; and that erected in honour of Lomonosov, at Arkhangel. Martos has been styled the Canova of Russia; and while some have admitted that his works are inferior to those of the great Italian artist in point of refined elegance and high finish, they assert them to be free from that mannerism and over-studied gracefulness which were Canova's defects. It has been further admitted that they do not evince equal power of imagination with those of his countryman Kozlovsky, although on the other hand they stand the test of a critical scrutiny much better. Their characteristics are nobleness of conception, truth of expression, and freedom, without negligence, of execution. In the draping of his figures he was, if anything, superior to Canova, besides which he had a particular talent for bas-relief subjects. One of the most admired of these is that which adorns the monument of the grand-duchess Helena Paulovna, and which represents Hymen extinguishing a torch. Martos died April 17th, 1835, being upwards of eighty years of age.

MARTYN, HENRY, known as *The Missionary*, born 1781, died 1812. The short life of this amiable and zealous man may thus in brief be delineated. His birth was obscure. He was the son of a person who had been a labourer in the mines at Gwennap in Cornwall, but who was probably a person of talent and virtue, as he raised himself to the situation of clerk to a merchant at Truro, in which town Henry Martyn was born. He had his education in the grammar-school of Truro, and having acquired a considerable share of grammar learning, he tried for a scholarship in Corpus Christi College, Oxford; but failing in this, in 1797 he entered Saint John's College, Cambridge. Here he pursued his studies with such energy, that in 1801 he came out senior wrangler. During this period also his mind became directed with more than common earnestness to the truths of revelation. The death of his father is thought to have affected him at this period of his life so deeply as to have had no small share in turning his thoughts into the channel in which from this time they continued to flow; and not less the intimacy which at this time began with the Rev. Charles Simeon, the celebrated evangelical preacher in the university of Cambridge. He was chosen fellow of St. John's in March, 1802; but out of zeal in the cause of religion, he finally determined to devote himself to the work in which many of his countrymen had by that time begun to engage themselves, of propagating Christianity in nations which had not received it. There had been, it is true, a Society in England associated for the purpose of propagating the gospel in foreign parts, but a new impulse and a new energy were given to such operations by the establishment of Missionary Societies, supported by the Methodists, the Independent Dissenters, and by the Evangelical party in the church. Mr. Martyn was not content with supporting this object by his influence at home, but he proposed himself to the African and Eastern Missionary Society as a person willing to undertake the duties of a missionary in the East, and finally embarked for India in 1805.

It now became necessary that he should make himself master of the languages of the countries which he was about to visit; and with what success he studied them is evidenced by the fact that he had the superintendence of the translations of the New Testament made under the instructions of the Missionary Society, both into Persian and Hindustanee. He made also some progress in an Arabic translation. In his capacity of missionary he traversed large tracts both of India and Persia. After above five years' labour in these countries, his health began to decline, and it soon became manifest that he would see his native shores no more. He did however make the attempt to return; but his strength wholly failing him, he was obliged to halt at Tokat, in Asia Minor, about 250 miles from Constantinople, where in a few days he died. The regrets in England which this event occasioned were great. Much was expected from him, and much would probably have been done by him in the cause to which he had devoted himself. As it was, he brought not a few both Hindus and Mohammedans to make profession of the Christian faith, and he caused the Scriptures to be extensively dispersed among a people who had not previously known them.

An interesting account of his life, compiled from various Journals left by him, was published by the Rev. John Sargent, 1819.

MARTYR, JUSTIN. [Justin Martyr.]

MARTYRS, MARTYROLOGY, from the Greek *Martur* or *Martus* (*μάρτυρ* or *μάρτυς*), *a witness*.

By the term *martyr* we now generally understand a person who suffers death rather than renounce his religious opinions; and those who have made a profession of their faith and thereby endured sufferings short of death are called *confessors*. These terms appear to have been used in the same sense by some of the early Christian writers; but others give the title of *martyr* to all who suffered tortures on account of their faith, and that of *confessor* to those who were only imprisoned for its avowal. Tertullian calls the latter 'martyres designati,' *martyrs elect* The duty of enduring suffering, and even death, for the sake of religion was plainly taught by Christ and the apostles. (*Matt.*, x. 17-39; xvi. 25; *Rev.*, ii. 10, 11.) In the *Acts of the Apostles* we have several instances of the patience and even exultation of the first Christians under persecution; and in some passages martyrs are spoken of with peculiar honour. (*Acts*, xxii. 20; 2 *Tim.*, i. 8; *Rev.*, ii. 13; vi. 9-11; xvii. 6; xx. 4.) The annals of the early Christian church contain the histories of many martyrs, whose astonishing fortitude under the most cruel tortures was doubtless one great cause of the rapid diffusion of Christianity. Among the earliest and most valuable documents relating to this subject are the letter of the church at Smyrna, giving an account of the martyrdom of Polycarp (A.D. 167), and that of the churches at Lyon and Vienne (A.D. 177), concerning the martyrs who suffered in the same reign, namely, that of Marcus Aurelius Antoninus. (Eusebius, *Ecc. Hist.*, iv. 5; v. i.; and Lardner's *Works*, vol. vii., p. 150, edition of 1831.) We learn from these accounts that martyrs were highly honoured by the church, but we read nothing of that intercessory power nor of those extraordinary privileges which were ascribed to them in later ages. The degree of honour paid to them is expressed by the writers of the letter from Smyrna, where they state that the governor was induced to refuse their request to have the body of Polycarp delivered to them, 'lest they should leave him that was crucified, to worship this man; . . . . little considering that we can never forsake Christ, who has suffered for the salvation of all men. Him we worship as the Son of God. The martyrs we love as the disciples and imitators of the Lord.' But in less than a century the reverence felt towards martyrs became quite extravagant and superstitious. We learn from the writings of Cyprian, bishop of Carthage (A.D. 248), that the sufferings of martyrdom were held to purge away the stain of sin, so that the martyr was admitted at once into paradise without needing the fires of purgatory: martyrs were thought to expiate by their blood not only their own sins, but those of other men, and even of the church; and the fiery baptism of martyrdom was accounted of equal efficacy with the sacraments of Christ. The sense of pain was believed to be blunted or even removed by miraculous power. If they expired under their tortures, temples (called *martyrum confessiones* or *memoriæ*) were built over their graves, yearly festivals were instituted in their honour, their relics were held sacred and believed to have the power of working miracles, and their intercession with God was invoked as being peculiarly prevalent. If their sufferings fell short of death, they had ever after the highest authority in the church. But these honours appear sometimes to have had a bad effect on those to whom they were paid, for Cyprian complains strongly of the disgraceful conduct of some who had been confessors.

In proportion to the honour paid to martyrdom was the disgrace attached to those who feared it. But here we observe a remarkable difference. In the earliest ages the Christians, acting upon Christ's command in *Matt.*, x. 23, did not think it disgraceful to avoid persecution by flight; but in later times the glory ascribed to martyrdom induced men to throw themselves in its way. Tertullian wrote a book against all flight in persecution; and Cyprian himself, when he retired from Carthage during a persecution, did not attempt to defend his conduct by general arguments, but pleaded an express revelation from God as his excuse. In a word, the martyrs of this age seem to have had more ambition and less steadfastness than those of earlier times.

The earliest accounts of Christian martyrdoms, for instance, that of Stephen in the *Acts* (vii.), are related with the utmost simplicity; but it was not long before the narratives of the deaths of martyrs were adorned with accounts of miracles, which, to say the least, are difficult to believe. This fashion had commenced even in the second century, for we find examples of it in the letter already mentioned, which relates the death of Polycarp. On these miracles Middleton remarks, 'These deaths of the primitive martyrs seldom failed of being accompanied by miracles, which, as we find them related in the old Martyrologies, were generally copied from each other: concerning sweet smells issuing from their bodies, and their wonderful resistance to all kinds of torture; and the miraculous cures of their wounds and bruises, so as to tire their tormentors by the difficulty of destroying them, which yet, after a vain profusion of miracles, was always effected at the last.' (*Free Enquiry*, p. 126, note.)

It is very difficult to ascertain the number of martyrs who suffered in the early persecutions. Some writers have made it enormous, others quite insignificant. Among the latter is Dodwell, who has written an elaborate dissertation on the subject. (*Dissertationes Cyprianicæ*, Diss. xi.) The expressions of Eusebius and other ecclesiastical writers would lead us to infer that the number of martyrs was considerable, but probably it has been much overrated.

Middleton has shown that many of the accounts in the Martyrologies are fabulous. He mentions, in his 'Letter from Rome,' some curious instances in which persons who never existed, heathen deities with their names slightly or not at all changed, and even inanimate objects, have been canonized as saints and martyrs.

That department of ecclesiastical history which relates to the acts and deaths of martyrs is termed *martyrology;* and a work embracing one or more such narratives is called *a martyrology.* As examples of this description of works we may mention the 'Martyrology' of Eusebius, which was translated into Latin by Jerome, and was celebrated in the early church, but is lost; that ascribed to the venerable Bede, but the genuineness of which is very doubtful; and the 'Acts and Monuments' of Fox, which is an elaborate and valuable record of the sufferings of the English reformers.

Much interesting information on this subject may be found in Ruinart's *Acta Martyrum*, Dodwell's *Dissertationes Cyprianicæ*, v., xi., xii., xiii., and Dr. Conyers Middleton's *Free Enquiry into the Miraculous Powers supposed to have subsisted in the Christian Church.*

MARVEJOLS. [LOZERE.]

MARVELL, ANDREW, was born on the 15th of November, 1620, at Kingston-upon-Hull, where his father was master of the grammar-school and lecturer of Trinity church. At the age of fifteen he was sent to Trinity College, Cambridge. All that is known of Marvell's career through the university is what may be gathered, and that is not much certainly, from the following entry in the Conclusion Book of his college, under date September 24th, 1641. 'It is agreed by the master and eight seniors that Mr. Carter, Dominus Wakefield, Dominus Marvell, Dominus Waterhouse, and Dominus Maye, in regard that some of them are reported to be married, and the others looke not after their dayes nor acts, shall receave no more benefitt of the college, and shall be out of their places, unless they show just cause to the college for the contrary in three months.'

For the ten following years there is little information respecting Marvell, though some notion of his occupations during that time may be gathered from the following passage of a letter from Milton to Bradshawe, dated February 21, 1652:—'He (Marvell) hath spent four years abroad in Holland, France, Italy, and Spain, to very good purpose, as I believe, and the gaining of those four languages; besides he is a scholar, and well read in the Latin and Greek authors, and no doubt of an approved conversation, for he comes now lately out of the house of the Lord Fairfax, who was general, where he was intrusted to give some instructions in the languages to the lady his daughter.'

In 1660 Andrew Marvell commenced his parliamentary career. We may judge of the manner in which he acted in that course from an anecdote which has been often related, varying somewhat as to details, though the same in the main circumstances.

The following version of it is extracted from a pamphlet printed in Ireland about 1754; but we think it has too melodramatic an air to be strictly accurate. 'The borough of Hull, in the reign of Charles II., chose Andrew Marvell, a young gentleman of little or no fortune, and maintained him in London for the service of the public. His understanding, integrity, and spirit were dreadful to the then infamous administration. Persuaded that he would be theirs for properly asking, they sent his old schoolfellow the lord-treasurer Danby, to renew acquaintance with him in his garret. At parting the lord-treasurer, out of pure affection, slipped into his hand an order upon the treasury for 1000*l.*, and then went to his chariot. Marvell, looking at the paper, calls after the treasurer, 'My lord, I request another moment.' They went up again to the garret, and Jack, the servant boy, was called. 'Jack, child, what had I for dinner yesterday?' 'Don't you remember, sir? You had the little shoulder of mutton that you ordered me to bring from a woman in the market.' 'Very right, child. What have I for dinner to-day?' 'Don't you know, sir, that you bid me lay by the bladebone to broil?' 'Tis so; very right, child; go away.' 'My lord, do you hear that? Andrew Marvell's dinner is provided; there's your piece of paper. I want it not. I know the sort of kindness you intended. I live here to serve my constituents: the ministry may seek men for their purpose; I am not one.'

Marvell was twice elected member for Hull in 1660. In April, 1661, he thus writes to his constituents:—'I perceive you have again (as if it were grown a thing of course) made choice of me, now the third time, to serve you in parliament: which as I cannot attribute to any thing but your constancy, so God willing, as in gratitude obliged, with no less constancy and vigour I shall continue to execute your commands and study your service.' Marvell really had cause to be grateful for their constancy. They were undeviating in their support of a man who had neither wealth, nor power, nor rank, nor even brilliant reputation to strike the vulgar eye and dazzle the vulgar imagination; and who had in fact nothing to recommend him but his unostentatious adherence to what he considered to be the line of his duty.

Throughout the whole of Marvell's parliamentary career the electors are no less deserving of praise than the elected. In the first parliament in which Marvell served, he and his colleague, Mr. Ramsden, used to write jointly. But afterwards Colonel Gilley was elected in the room of Mr. Ramsden, and then, in consequence of some misunderstanding between him and Marvell, the latter wrote singly to his constituents. He thus alludes to the difference between them:—'Though perhaps we may differ in our advice concerning the way of proceeding, yet we have the same good ends in general; and by this unlucky falling out we shall be provoked to a greater emulation of serving you. I must beg you to pardon me for writing singly to you, for if I wanted my right hand yet I would scribble to you with my left rather than neglect your business.'

A gap occurs in Marvell's correspondence after June, 1661. He appears to have been in Holland for a considerable time. Lord Bellasis, then high-steward of Hull, having requested the corporation to proceed to the election of a new member, they wrote to Marvell, who immediately returned to England and resumed his seat in the house.

About three months after his return Marvell again left England as secretary to Lord Carlisle, who was appointed ambassador extraordinary to Russia, Sweden, and Denmark. Marvell's acceptance of this appointment seems a little at variance with his alleged invariable refusal to accept any mark of royal favour.

Marvell was absent on this embassy nearly two years.

On his return he began to correspond with his constituents almost every post.

The following passages are characteristic both of the man and the times:—

'*Nov.* 14, 1667.—Really the business of the House hath been of late so earnest daily and so busy, that I have not had the time and scarce vigour left me by night to write to you; and to-day, because I would not omit any longer, I lose my dinner to make sure of this letter.' *Letter to Mayor and Aldermen of Hull.*

'*April* 14, 1670.—The king about ten o'clock took boat with Lauderdale only, and two ordinary attendants, and rowed awhile as towards the bridge; but soon turned back to the Parlt. Stairs, and so went up into the House of Lords and took his seat. Almost all of them were amazed, but all seemed so, and the duke of York especially was very much surprised. He told them it was a privilege he claimed from his ancestors, to be present at their deliberations. After three or four days' continuance, the lords were very well used to the king's presence, and sent the lord-steward and lord-chamberlain to him to enquire when they might wait as an House on him, to render their humble thanks for the honour he did them. The hour was appointed them, and they thanked him, and he took it well. The king has ever since continued his session among them, and says, "it is better than going to a play."' *Letter to William Ramsden, Esq.*

The following presents a curious picture of the government of Charles II.:—

'The king having, upon pretence of the great preparations of his neighbours, demanded 300,000*l.* for his navy (though, in conclusion, he hath not sent out any), that the parliament should pay his debts, which the ministers would never particularize to the House of Commons, our house gave several bills. You see how far things were stretched beyond reason, there being no satisfaction how those debts were contracted; and all men foreseeing that what was given would not be applied to discharge the debts, which I hear are at this day risen to four millions, but diverted as formerly. Nevertheless, such was the number of the constant courtiers, increased by the apostate patriots, who were bought off for that term, some at six, others at ten, one at fifteen thousand pounds, in money; besides what offices, lands, and reversions to others, that it is a mercy they gave not away the whole land and liberty of England. The duke of Buckingham is again 140,000*l.* in debt, and, by this prorogation, his creditors have time to tear all his lands in pieces. The House of Commons has run almost to the end of their line, and are grown extremely chargeable to the king and odious to the people. They have signed and sealed 10,000*l.* a year more to the duchess of Cleveland, who has likewise near 10,000*l.* a year out of the new farm of the country excise of beer and ale; 5000*l.* a year out of the post-office; and, they say, the reversion of all the king's leases; the reversion of all places in the custom-house, the green wax, and, indeed, what not. All promotions, spiritual and temporal, pass under her cognizance.'

In 1672 Marvell engaged in a controversy with Dr. Samuel Parker (afterwards nominated bishop of Oxford by James II.). The following are a few of Parker's opinions, published in 1670, in a book entitled 'Ecclesiastical Polity.' 'It is better to submit to the unreasonable impositions of Nero and Caligula than to hazard the dissolution of the state.' 'Princes may with less hazard give liberty to men's vices than to their consciences.' Of the different sects then subsisting he held 'that tenderness and indulgence to such men were to nourish vipers in our bowels, and the most sottish neglect of our own quiet and security.'

Marvell's various publications were mostly of a temporary interest. Mr. Dove gives the following account of the close of his career. 'Marvell had now rendered himself so obnoxious to the usual friends of a corrupt court, and to the heir presumptive, James, duke of York, that he was beset on all sides by powerful enemies, who even proceeded so far as to menace his life. Hence he was obliged to use great caution, to appear seldom in public, and frequently to conceal the place of his abode; but all his care proved ineffectual to preserve him from their vengeance, for he died on the 16th of August, 1678, aged fifty-eight years, not without strong suspicions (as his constitution was entire and vigorous) of having suffered under the effect of poison.' (*Life of Andrew Marvell*, p. 65, London, 1832.)

Marvell's powers as a poet were not sufficient to ensure him lasting fame. Few or none of his poetical compositions, any more than his prose, obtained a lasting popularity Many of his verses, particularly the satirical, are defaced by the coarseness of his time, from which his contemporary, Milton, is so remarkably free. Others display a degree of feeling and a perception of the beauties of nature, expressed with a harmony of versification and felicity of language which not unfrequently recall the 'L'Allegro' and 'Il Penseroso' of Milton. But Marvell's verse did not possess sufficient vitality to secure its continued existence. He says of it himself, with a sort of prophetic truth, in his lines to 'His Coy Mistress,'—

> 'But at my back I always hear
> Time's winged chariot hurrying near;
> And yonder all before us lie
> Deserts of vast eternity.
> Thy beauty shall no more be found,
> Nor in thy marble vault shall sound
> My echoing song.'

Upon the whole Andrew Marvell's claim to be honourably remembered is founded rather on his moral than his intellectual qualities. His intellectual merits are those of a wit and satirist; and though in these departments considerably above mediocrity, and even famous in his day, he could scarcely have hoped for a different fate from that of other wits and satirists who are now forgotten. But the degree in which Andrew Marvell possessed that very rare quality, political integrity, gives him a claim to the remembrance and even the reverence of after-ages, *still* greater than is due to him as the friend and associate of Milton.

(Marvell's Works, by Captain Edward Thompson, with his *Life*, London, 1776.)

MARWAR, a district or division of the province of Ajmeer, lying between 24° 35′ and 27° 45′ N. lat., and between 70° 25′ and 75° 15′ E. long. Its greatest length from north-east to south-west is 310 miles, and its mean breadth is about 120 miles. The surface of the district is irregular and mountainous, rising towards the south; some of the mountains in that quarter indicate by the barometer an elevation of 5000 feet above the level of the sea: European fruits and shrubs are produced on their summits. The country contains many hill forts, and is for the most part subject to the rajah of Joudpore. The population is partly Mohammedan and partly Hindu; but there are, besides these sects, many tribes of uncivilized people, who, by their predatory habits, are frequently troublesome to their more quiet neighbours. The failure of the annual fall of rain in 1811, together with the desolation occasioned by clouds of locusts, produced a dreadful famine throughout the district, and drove great numbers of the inhabitants into the province of Gujerat, which, in the following year, also experienced a failure of rain, and the people died by thousands in a state of the greatest misery, so that it is said scarcely one in a hundred ever returned to his native province. Marwar contains few towns of any size. Nagore, in 27° 8′ N. lat. and 73° 33′ E. long., stands upon barren sandhills, with scarcely any vegetation within a mile of its walls, and it is badly supplied with water. The only other town requiring notice is Joudpore, the capital and the residence of the rajah, in 26° 18′ N. lat. and 73° 5′ E. long. This country has been so little visited by Europeans, that our knowledge concerning it is very scanty. The castle or palace of Joudpore is said to be a large and very magnificent building. In 1818, when part of his territory was in the occupation of the sovereign of Jeypore, the rajah of Joudpore made an arrangement with the English government, under which, in return for our protection, he bound himself to the payment of an annual tribute of 10,800*l.*, and engaged to furnish a contingent of 1500 cavalry. The entire revenue of the district is estimated at 50 lacs of rupees (500,000*l.*), but usually falls far short of that sum.

MARY I., Queen of England, was the daughter of Henry VIII., by his first wife Catherine of Aragon, and was born at Greenwich, on the 18th (Burnet says 19th) of February, 1516. She was the only one of several children borne by her mother that lived; and on this account, according to Burnet, and because her father was then 'out of hopes of more children,' he in 1518 'declared his daughter princess of Wales, and sent her to Ludlow to hold her court there, and projected divers matches for her.' It was first settled that she should be married to the dauphin by a treaty with the king of France, dated 9th November, 1518, which however was soon after broken. Then it was arranged, 22nd June, 1522, that her hand should be given to the emperor

Charles V. On Charles declining to fulfil this bargain, some overtures of a Scottish marriage followed in September, 1524. Finally, in April, 1527, it was agreed that the princess should be given in marriage either to the French king Francis, or to his second son, the duke of Orleans; but before it was determined whether she should be married to the father or the son, the affair of her mother's divorce, implying her own illegitimacy, came to be agitated, and stopped all match-making for some years.

Mary was brought up from her infancy in a strong attachment to the antient religion, under the care of her mother, and Margaret, countess of Salisbury, the effect of whose instructions was not impaired by the subsequent lessons of the learned Ludovicus Vives, who, though somewhat inclined to the reformed opinions, was appointed by Henry to be her Latin tutor. After her mother's divorce, Mary was deprived of her title of princess of Wales, which was transferred to the Princess Elizabeth soon after she came into the world; and during all the time that Anne Boleyn lived, Mary, who clung to her mother's cause and her own, remained in a state of estrangement from her father. In the mean time, according to Lord Herbert, negotiations for disposing of her in marriage were twice entered into by her near relation the emperor, without her father's consent having been asked; in 1533 he offered her to James V. of Scotland, and in 1535 to her old suitor the dauphin. But immediately after the execution of Queen Anne in 1536, a reconcilement took place between Henry and his eldest daughter, who, with great reluctance, was now prevailed upon to make a formal acknowledgement both of Henry's ecclesiastical supremacy—utterly refusing 'the bishop of Rome's pretended authority, power, and jurisdiction within this realm heretofore usurped'—and of the nullity of the marriage of her father and mother, which she declared was 'by God's law and man's law incestuous and unlawful.' (See the 'Confession of me, the Lady Mary,' as printed by Burnet, 'Hist. Ref.,' from the original, 'all written with her own hand.') By the new act of succession however, passed this year, she was again, as well as her sister Elizabeth, declared illegitimate, and for ever excluded from claiming the inheritance of the crown as the king's lawful heir by lineal descent. While she was thus circumstanced, 'excluded,' as Lord Herbert expresses it, 'by act of parliament from all claim to the succession except such as the king shall give her' by the powers reserved to him of nominating his own successor after failure of the issue of Queen Jane, or of any other queen whom he might afterwards marry, she was in 1538 offered to Don Louis, prince of Portugal, and the next year to William, son of the duke of Cleves. Meanwhile continuing to yield an outward conformity to all her father's capricious movements in the matter of religion, she so far succeeded in regaining his favour, that in the new act of succession, passed in 1544, the inheritance to the crown was expressly secured to her next after her brother Edward and his heirs, and any issue the king might have by his then wife Catherine Parr.

Mary's compliance with the innovations in religion in her father's time had been dictated merely by fear or self-interest; and when, after the accession of her brother, his ministers proceeded to place the whole doctrine, as well as discipline, of the national church upon a new foundation, she openly refused to go along with them; nor could all their persuasions and threats, aided by those of her brother himself, move her from her ground. Full details of the various attempts that were made to prevail upon her may be found in Burnet's 'History,' and in King Edward's 'Journal.' Mention is made in the latter, under date of April, 1549, of a demand for the hand of the Lady Mary by the duke of Brunswick, who was informed by the council that 'there was talk for her marriage with the infant of Portugal, which being determined, he should have answer.' About the same time it is noted that 'whereas the emperor's ambassador desired leave, by letters patents, that my Lady Mary might have mass, it was denied him.' On the 18th of March of the following year, the king writes: 'The Lady Mary, my sister, came to me at Westminster, where, after salutations, she was called, with my council, into a chamber; where was declared how long I had suffered her mass, in hope of her reconciliation, and how now being no hope, which I perceived by her letters, except I saw some short amendment, I could not bear it. She answered, that her soul was God's, and her faith she would not change, nor dissemble her opinion with contrary doings. It was said, I constrained not her faith, but wished her not as a king to rule, but as a subject to obey; and that her example might breed too much inconvenience.' In fact throughout this reign the princess Mary was the centre of the intrigues of the Catholic party, and the hope of her succession their main strength and support. In the summer of this same year a project was entered into by her friends at home and abroad for removing her from England, where her faith at least, if not her person, was probably supposed to be in some danger. On the 29th of August, her brother writes: 'Certain pinnaces were prepared to see that there should be no conveyance over sea of the Lady Mary secretly done. Also appointed that the lord chancellor, lord chamberlain, the vice-chamberlain, and the secretary Petre should see by all means they could whether she used the mass; and if she did, that the laws should be executed on her chaplains.'

Mary's firm adherence to the Roman faith finally induced Edward, under the interested advice of his minister Northumberland, to attempt at the close of his life to exclude her from the succession, and to make over the crown by will to the Lady Jane Grey, an act which was certainly without any shadow of legal force. [Edward VI.] Although Lady Jane however was actually proclaimed, scarcely any resistance was made to the accession of Mary, the commencement of whose reign accordingly is dated from the 6th of July, 1553, the day of her brother's death. [Grey, Lady Jane.]

Mary was scarcely seated on the throne when she proceeded to re-establish the antient religion. In the course of the month of August, Bonner, Gardiner, and three other bishops, who had been deposed for nonconformity in the late reign, were restored to their sees, and the mass began again to be celebrated in many churches. In the following month archbishop Cranmer and bishop Latimer were committed to the Tower; and in November the parliament passed an act repealing all the acts, nine in number, relating to religion, that had been passed in the late reign, and replacing the church in the same position in which it had stood at the death of Henry VIII. These measures, and the other indications given by the court of a determination to be completely reconciled with Rome, were followed by the insurrection, commonly known as that of Sir Thomas Wyatt, its principal leader, which broke out in the end of January, 1554, but was in a few days effectually put down; its suppression being signalised by the executions of the unfortunate Lady Jane Grey and her husband the Lord Guildford Dudley, of her father the duke of Suffolk, and finally, of Wyatt himself.

On the 25th of July, Mary was married in the cathedral church of Winchester to the prince of Spain, afterwards Philip II., the son of the emperor Charles V.; and the re-union with Rome was speedily completed by a parliament which assembled in the beginning of November, and which passed acts repealing the attainder of cardinal Pole, who immediately after arrived in England with the dignity of papal legate, restoring the authority of the pope, repealing all laws made against the see of Rome since the 20th of Henry VIII., reviving the antient statutes against heresy, and in short re-establishing the whole national system of religious policy as it had existed previous to the first innovations made by Henry VIII. By one of the acts of this session of parliament also Philip was authorised to take the title of king of England during the queen's life. All these acts appear to have been passed with scarcely any debate or opposition in either house, except occasionally upon mere points of detail and form.

The remainder of the history of the reign of Mary is occupied chiefly with the sanguinary persecutions of the adherents to the reformed doctrines. The Protestant writers reckon that about two hundred and eighty victims perished at the stake, from the 4th of February, 1555, on which day John Rogers was burnt at Smithfield, to the 10th of November, 1558, when the last *auto-du-fé* of the reign took place by the execution in the same manner of three men and two women at Colchester. Dr. Lingard admits that after expunging from the Protestant lists 'the names of all who were condemned as felons or traitors, or who died peaceably in their beds, or who survived the publication of their martyrdom, or who would for their heterodoxy have been sent to the stake by the reformed prelates themselves, had they been in possession of the power,' and making every other reasonable allowance, it will still be found 'that in the space of four years almost two hundred persons perished in the flames for religious opinion.' Among the most distinguished sufferers were Hooper bishop of Gloucester, Ferrar of St. David's, Latimer of Worcester, Ridley of London, and Cranmer archbishop of Canterbury. Gardiner, bishop of Winchester and lord chancellor, was Mary's chief minister till his death in November, 1555, after which the direction of affairs fell mostly into the hands of cardinal Pole, who after Cranmer's deposition was made archbishop of Canterbury; but the notorious Bonner, Ridley's successor in the see of London, has the credit of having been the principal instigator of these atrocities, which, it may be remarked, so far from contributing to put down the reformed doctrines, appear to have had a greater effect in disgusting the nation with the restored church than all other causes together.

At the same time that the new opinions in religion were thus attempted to be extinguished by committing the bodies of those who believed in them to the flames, the queen gave a further proof of the sincerity of her own faith by restoring to the church the tenths and first-fruits, with all the rectories, glebe-lands, and tithes that had been annexed to the crown in the times of her father and brother. She also re established several of the old religious houses, and endowed them as liberally as her means enabled her.

Tired both of the country and of his wife, Philip left England, in the beginning of September, 1555, and continued absent for about a year and a half. The bond however by which this marriage attached the English court to Spain and the Empire remained the same as ever; and when, after a short cessation of hostilities, war recommenced in the spring of 1557 between Spain and France, Mary was prevailed upon to join the former against the latter power. The principal consequence of this step, in so far as this country was concerned, was the loss of the only remaining English continental possession, the town and territory of Calais, which surrendered to the duke of Guise, in January, 1558, after a siege of a few days. This event, which was regarded as a national disgrace worse than any mere loss, excited the bitterest feelings of dissatisfaction with the policy of the court; and Mary herself is said never to have recovered from the blow. Some ineffectual efforts were made to retaliate upon France by force of arms; but at last negotiations for a peace between the three belligerent powers were opened at Cambray, in the midst of which queen Mary died, worn out with bodily and mental suffering, on the 17th of November, 1558, in the forty-third year of her age and the sixth of her reign. She is affirmed to have said on her deathbed, that if her breast should be opened after her decease, Calais would be found to be written on her heart. Mary left no issue, and was succeeded on the throne by her half-sister Elizabeth. [ELIZABETH.]

MARY STUART, queen of Scotland, was born on the 7th of December, 1542. She was the third child of king James V. of Scotland, by his wife Mary of Lorraine, daughter of the duke of Guise, who had previously borne her husband two sons, both of whom died in infancy. A report prevailed that Mary too was not likely to live; but being unswaddled by her nurse at the desire of her anxious mother, in presence of the English ambassador, the latter wrote to his court that she was as goodly a child as he had seen of her age. At the time of her birth her father lay sick in the palace of Falkland; and in the course of a few days after he expired, at the early age of thirty, his death being hastened by distress of mind occasioned by the defeats which his nobles had sustained at Fala and Solway Moss. James was naturally a person of considerable energy and vigour both of mind and body, but previous to his death he fell into a state of listlessness and despondency, and after his decease it was found that he had made no provision for the care of the infant princess, or for the administration of the government. The ambitious Beatoun seized this opportunity, and producing a testament which he pretended was that of the late king, immediately assumed the office and title of regent. The fraud was soon discovered; but by the haste and imprudence of the regent Arran and Henry VIII. of England, who wished a marriage agreed to between his son and the young queen, Beatoun regained his influence in the country; and on the 9th of September, 1543, Mary was crowned by the archbishop, who was also immediately afterwards appointed lord high chancellor of the kingdom. He had even the address to win over the regent Arran to his views, both political and religious; and thus the French or Roman Catholic party obtained the ascendancy. The first two years of Mary's life were spent at Linlithgow, in the royal palace of which she was born; she was then removed to Stirling castle; and when the disputes of parties in the country rendered this a somewhat dangerous residence, she was carried to Inchmahome, a sequestered island in the lake of Monteith, where she remained about two years. In the meantime a treaty of marriage had been concluded between her and the dauphin Francis; and in terms of the treaty it was resolved she should be sent into France to be educated at the French court, until the nuptials could be solemnized. Accordingly in the fifth year of her age she was taken to Dumbarton, where she was put on board the French fleet; and setting sail towards the end of July, 1548, she was, after a tempestuous voyage, landed on the 14th of August at Brest, whence she proceeded by easy stages to the palace at St. Germaine-en-Laye. At every town in her progress she was received with all the honours due to her royal rank, and as a mark of respect and joy the prisons were thrown open and the prisoners set free.

Soon after her arrival at her destination Mary was placed with the French king's own daughters in one of the first convents of the kingdom, where she made such rapid progress in the acquisition of the literature and accomplishments of the age, that when visiting her in the end of the year 1550, her mother, Mary of Guise, with her Scottish attendants, burst into tears of joy. She did not however remain long in this situation. Perceiving the bent of her mind to the society and occupations of a nunnery, which did not accord with the ambitious projects entertained by her uncles of Lorraine, they soon brought her to the court, which, as Robertson observes, was one of the politest but most corrupt in Europe. Here Mary became the envy of her sex, surpassing the most accomplished in the elegance and fluency of her language, the grace and liveliness of her movements, and the charm of her whole manner and behaviour. The youthful Francis, to whom she was betrothed, and was soon to be united in wedlock, was about her own age, and they had been playmates from early years: there appears also to have grown up a mutual affection between them; but the dauphin had little of her vivacity, and was altogether considerably her inferior both in mental endowments and personal appearance. The marriage, which took place on the 24th of April, 1558, was celebrated with great pomp; and when the dauphin, taking a ring from his finger, presented it to the cardinal Bourbon, archbishop of Rouen, who, pronouncing the benediction, placed it on the finger of the lovely and youthful bride, the vaulted roof of the cathedral rung with the shouts and congratulations of the assembled multitude.

The solemnities being over, the married pair retired to one of their princely retreats for the summer; but that season was hardly gone when, a vacancy having occurred on the throne of England by the death of Queen Mary, claims were put forth on behalf of the queen of Scots through her grandmother, who was eldest daughter of King Henry VII. of England; and notwithstanding Elizabeth had ascended the throne, and was, like her sister Mary (both daughters of King Henry VIII.), queen both *de facto* and by the declaration of the parliament of England, yet this claim for the Scottish princess was made and continued to be urged with great pertinacity by her ambitious uncles the princes of Lorraine. On every occasion on which the dauphin and dauphiness appeared in public, they were ostentatiously greeted as the king and queen of England; the English arms were engraved upon their plate, embroidered on their banners, and painted on their furniture; and Mary's own favourite device at the time was, the two crowns of France and Scotland, with the motto *Aliamque moratur*, meaning that of England. Henri II. died in July, 1559, and in September of the same year Francis was solemnly crowned at Rheims. Mary was now at the height of her splendour; it was doomed however to be only of short continuance. In June, 1560, her mother died; and in December of the same year, her husband, who had been wasting away for some months, expired. By this latter event, Catherine de' Medici rose again into power in the French court, and Mary, who did not relish being second where she had been the first, immediately determined on quitting France and returning to her native country. The queen of England however interposed; and because Mary would not abandon all claim to the English throne, refused to grant her a free passage, being moved to this piece of discourtesy not less perhaps by envy than by jealousy. Mary notwithstanding resolved to go, and at length, after repeated delays, still lingering on the soil where fortune had smiled upon her, she reached Calais. Here she bade adieu to her attendants, and sailed for Scotland; but as long as the French coast remained in view, she continued involuntarily to exclaim, 'Farewell, France! Farewell, beloved country!' She landed at Leith on the 19th August, 1561, in the 19th year of her age, and after an absence from Scotland of nearly 13 years. She was now, in the language of Robertson, 'a stranger to her subjects, without experience, without allies, and almost without a friend.'

A great change had taken place in Scotland since Mary was last in the country. The Roman Catholic religion was then supreme; and under the direction of cardinal Beatoun the Romish clergy displayed a fierceness of intolerance which seemed to aim at nothing short of the utter extirpation of every seed of dissent and reform. The same causes however which gave strength to the ecclesiastics gave strength also, though more slowly, to the great body of the people; and at length, after the repeated losses of Floddon and Fala, and Solway Moss and Pinkey,—which, by the fall of nearly the whole lay nobility and leading men of the kingdom, brought all classes within the influence of public events,—the energies, physical and mental, of the entire nation were drawn out, and under the guidance of the reformer Knox expended themselves with the fury of awakened indignation upon the whole fabric of the antient religion. The work of destruction was just completed, and the Presbyterian government established on the ruins of the Roman Catholic, when Mary returned to her native land. She knew little of all this, and had been taught in France to shrink at the avowal of Protestant opinions: her habits and sentiments were therefore utterly at variance with those of her subjects; and, nurtured in the lap of ease, she was wholly unprepared for the shock which was inevitably to result from her being thrown among them.

Accordingly the very first Sunday after her arrival she commanded a solemn mass to be celebrated in the chapel of the palace; and, as might have been expected, an uproar ensued, the servants of the chapel were insulted and abused, and had not some of the lay nobility of the Protestant party interposed, the riot might have become general. The next Sunday Knox had a thundering sermon against idolatry, and in his discourse he took occasion to say that a single mass was, in his estimation, more to be feared than ten thousand armed men. Upon this, Mary sent for the reformer, desiring to have an interview with him. The interview took place, as well as one or two subsequent ones from a like cause; but the only result was to exhibit the parties more plainly at variance with each other. In one of these fruitless conferences the young queen was bathed in tears before his stern rebukes. Her youth however, her beauty and accomplishments, and her affability, interested many in her favour; and as she had from the first continued the government in the hands of the Protestants, the general peace of the country remained unbroken.

A remarkable proof of the popular favour which she had won, appeared in the circumstances attending her marriage with Darnley. Various proposals had been made to her from different quarters; but at length she gave up all thoughts of a foreign alliance, and her affections became fixed on her cousin Henry Stuart, lord Darnley, the youthful heir of the noble house of Lennox, to whom she was united on Sunday, 29th July, 1565, the ceremony of marriage being performed in the chapel of Holyrood-house, according to the rites of the Romish church. Whether the queen had any right to choose a husband without consent of parliament, was in that age, as Robertson observes, a matter of some dispute; but that she had no right to confer upon him, by her private authority, the title and dignity of king, or by a simple proclamation invest him with the character of a sovereign, was beyond all doubt: yet so entirely did she possess the favourable regard of the nation, that notwithstanding the clamours of the malecontents, her conduct in this respect produced no symptom of general dissatisfaction. The queen's marriage was particularly obnoxious to Queen Elizabeth, whose jealous eye had never been withdrawn from her rival. Knox also did not look favourably on it. Nevertheless the current of popular opinion ran decidedly in Mary's favour, and it was even remarked that the prosperous situation of her affairs began to work some change in favour of her religion.

This popularity however was the result of adventitious circumstances only. There existed no real sympathy or opinion between Mary and the great body of her people; and whatever led to the manifestation of her religious sentiments dissolved in the same degree the fascination which her other qualities had created. It is in this way we may account for the assistance given to Darnley in the assassination of Rizzio—an attendant on Mary, who seems to have come in place of Chatelard. The latter was a French poet who sailed in Mary's retinue when she came over from the Continent; and having gained the queen's attention by his poetical effusions, he proceeded, in the indulgence of a foolish attachment for her, to a boldness and audacity of behaviour which demanded at last the interposition of the law, and he was condemned and executed. Rizzio, a Piedmontese by birth, came to Edinburgh in the train of the ambassador from Savoy, a year or so before Chatelard's execution. He was skilled in music, had a polished and ready wit, and, like Chatelard, wrote with ease in French and Italian. His first employment at court was in his character of a musician; but Mary soon advanced him to be her French secretary; and in this situation he was conceived to possess an influence over the queen which was equally hateful to Darnley and the Reformers, though on very different grounds. Both therefore concurred in his destruction, and he was assassinated accordingly. Darnley afterwards disclaimed all concern in the conspiracy; but it was plain the queen did not believe and could not forgive him; and having but few qualities to secure her regard, her growing contempt of him terminated in disgust. In the mean time the well-known earl of Bothwell was rapidly advancing in the queen's favour, and at length no business was concluded, no grace bestowed, without his assent and participation. Meanwhile also Mary bore a son to Darnley; and after great preparations for the event, the baptism of the young prince was performed according to the rites of the Romish church. Darnley himself was soon after seized with the smallpox, or some dangerous distemper, the nature and cause of which are not very clear. He was at Glasgow when he was taken ill, having retired thither to his father somewhat hastily and unexpectedly. Mary was not with him, nor did she visit him for a fortnight. After a short stay they returned to Edinburgh together, when Darnley was lodged, not in the palace of Holyrood, as heretofore, but in the house of the Kirk of Field, a mansion standing by itself in an open and solitary part of the town. Ten days after, the house was blown up by gunpowder, and Darnley and his servants buried in the ruins. Whether Mary knew of the intended murder is not certain, and different views of the circumstances have been taken by different historians. The author of the horrid deed was Bothwell, and the public voice was unanimous in his reprobation. Bothwell was brought before the privy-council for the crime; but in consequence of the shortness of the notice, Lennox, his accuser, did not appear. The trial nevertheless proceeded, or rather the verdict and sentence; for, without a single witness being examined, Bothwell was acquitted. He was upon this not only continued in all his influence and employments, but he actually attained the great end which he had in view by the perpetration of the foul act. This was no other than to marry the queen herself, which he did in three months after; having in the interval met the queen, and carried her off a prisoner to his castle of Dunbar, and also raised a process of divorce against the lady Bothwell, his wife, on the ground of consanguinity, and got a decree in the cause just nine days before the marriage. Before the marriage, also, Mary created Bothwell duke of Orkney; and the marriage itself was solemnized at Holyrood-house by Adam Bothwell, bishop of Orkney, according to the forms both of the Romish and Protestant religions. [BOTHWELL.]

Public indignation could no longer be restrained. The nobles rose against Bothwell and Mary, who fled before an armed and indignant people from fortress to fortress. At length, after they had collected some followers, a pitched battle near Carbery Hill was about to ensue, when Mary abandoned Bothwell, and threw herself on the mercy of her subjects. They conducted her first to Edinburgh, and thence to the castle of Lochleven, where, as she still persisted to regard Bothwell as her husband, it was determined she should at once abdicate in favour of the prince her son James Instruments of abdication to that effect were accordingly prepared, and she was at last constrained to affix her signature to them; upon which the prince was solemnly crowned at Stirling, 29th July, 1567, when little more than a year old. Mary continued a prisoner at Lochleven; but by the aid of friends, in less than twelve months she effected her escape, and collected a considerable army. The battle of Langside ensued, where she was completely routed; upon which she fled towards Galloway, and thence passed into England, hoping to secure the favour of Elizabeth. In this however she was mistaken. Elizabeth refused her an audience, but declared her readiness to act as umpire between her and her subjects. Mary would not yield to this, or consent to be regarded in any other light than as queen of Scotland. The consequence was, that being now in the hands of her great rival, Elizabeth contrived to detain her a captive in her dominions till the end of the year 1586,—a period of about nineteen years,—when she was accused of being accessary to Babington's conspiracy against the queen of England. To try this accusation a commission was appointed by Elizabeth, but Mary refused to acknowledge its jurisdiction. 'I came into the kingdom,' she said, 'an independent sovereign, to implore the queen's assistance, not to subject myself to her authority. Nor is my spirit so broken by past misfortunes, or so intimidated by present dangers, as to stoop to anything unbecoming a crowned head, or that will disgrace the ancestors from whom I am descended, or the son to whom I leave my throne. If I must be tried, princes alone can try me: they are my peers; and the queen of England's subjects, however noble, are of a rank inferior to mine. Ever since my arrival in this kingdom I have been confined as a prisoner. Its laws never afforded me protection: let them not be perverted now, to take away my life.' Deluded however by the pretext that she would thus vindicate her character, Mary consented to be tried. The commission accordingly proceeded: Mary was condemned, and, on Wednesday the 8th of February, 1587, beheaded at Fotheringay castle, in the 45th year of her age. When about to enter the great hall which was prepared for her execution, she was allowed to stop and take farewell of the master of her household, Sir Andrew Melville, whom her keepers had not suffered to come into her presence for some weeks before. Melville kissed her hand, and kneeling down before her with tears in his eyes, declared this was the heaviest hour of his life. 'Not so to me,' said Mary: 'I now feel, my good Melville, that all this world is vanity. When you speak of me hereafter, say that I died firm in my faith, willing to forgive my enemies, conscious that I never disgraced my native country, and rejoicing in the thought that I had always been true to France, the land of my happiest years. Tell my son—,' and here she burst into a flood of tears, overcome by her feelings when she thought of her only child, the son of whom she had been so proud in his infancy, and whom she still loved notwithstanding his coldness and ingratitude,—'Tell my son, I thought of him in my last moments, and that I said I never yielded, by word or deed, to aught that might lead to his prejudice: tell him to remember his unfortunate parent; and may he be a thousand times more happy and prosperous than she ever was.' [ELIZABETH; JAMES I. of England.] She died professing the religion in which she had been brought up, and to her adherence to which many of her miseries may be traced.

For further particulars concerning Mary, and the love-letters, &c. which she is said to have written to Bothwell, we must refer to the writers who have minutely discussed the events of Mary's life. These writers are not few in number, from the time of Buchanan and Knox on the one hand, and Lesley, bishop of Ross, on the other, down to the present day, when Mr. Tytler's 'History of Scotland' is in course of issuing from the press. We may notice however Jebb's works on the subject, Anderson's 'Collections,' Goodall's 'Examination,' Tytler's 'Enquiry,' Whittaker, Laing, and Chalmers, and the 'Life of Mary,' by Henry Glassford Bell, which forms vol. 24 of Constable's 'Miscellany.'

MARY, wife of William III. [WILLIAM III.]

MARYBOROUGH. [QUEEN'S COUNTY.]

MARYLAND, one of the United States of North America, lies between 38° 3′ and 39° 42′ N. lat. and 75° 10′ and 79° 25′ W. long. It is divided into two portions by Chesapeake Bay and the Susquehanna river. That portion which is east of the bay is bounded on the south by Virginia for 15 miles; on the east by the Atlantic Ocean, which washes its shores for 35 miles; and by the state of Delaware, which extends 36 miles along its northern and 91 miles along its eastern boundary. Pennsylvania forms the whole northern boundary of this state, for 200 miles, along the parallel of 39° 42′. The western portion of Maryland is divided from Virginia by a straight line running north and south for about 36 miles, which constitutes the western boundary-line of Maryland. On the south, where it also borders on Virginia, the Potomac river, with its numerous windings and large æstuary, forms the boundary-line for 320 miles. The surface is calculated to be 10,000 square miles, or somewhat less than double the area of Yorkshire.

Surface and Soil.—The country east of Chesapeake Bay has a level surface as far north as Chester Bay, where it begins to be undulating, and towards the boundary of Pennsylvania isolated hills make their appearance. The soil is generally thin and sandy, but tolerably well cultivated. Along the shores both of the Atlantic and Chesapeake Bay marshy tracts of some extent occur. The largest is the Cypress Swamp, near the northern extremity of Sinepuxent Bay, a shallow arm of the sea, separated from the ocean by a ridge of low sand-hills, which however are intersected by some channels which form a communication between the bay and the ocean. Cypress Swamp partly belongs to Delaware, and is wooded. Along the eastern side of Chesapeake Bay several indentations occur, forming harbours for vessels of moderate size, as Pocomoke Bay, Fishing Bay, Choptank Bay, and Chester Bay. There are also several islands belonging to Maryland in Chesapeake Bay, of which the largest is Kent Island.

The country on the opposite shore of Chesapeake Bay is of the same description, but rather less fertile, its surface being mostly composed of a quartzose sand, without a sufficient quantity of clay to render it productive. But there are some productive tracts of considerable extent, as in the neighbourhood of Annapolis. North of the river Patapsco the country along the Chesapeake Bay is undulating, and possessed of a greater degree of natural fertility. About twenty miles from the shore the country rises into hills, which extend westward to the foot of the Blue Ridge, a part of the Appalachian range, a distance of about forty miles. In this hilly tract the fertility of the soil varies greatly; the extremes of fertility and sterility are frequently found in a very limited space. The country west of 77° 30′ W. long. is mountainous, being traversed from south to north by six or seven of the ranges which compose the Appalachian system. The valleys which are enclosed by these ridges are generally wide and fertile; they are from 500 to 800 feet above the level of the sea. The ranges themselves are rather narrow, but they rise to an elevation of from 2000 to 2500 feet.

Rivers.—The Potomac rises within the Appalachian Mountains, with two branches: the northern branch rises in 39° 12′ N. lat., on the eastern declivity of the Backbone Range, and runs in a valley in a north-eastern direction thirty miles, when it suddenly turns south-east, and breaks through two chains of mountains in about ten miles of its course; it then runs again north-east to Cumberland, and has a course of twenty miles in a valley; deflecting again to the south-east, it traverses a mountain range, and twenty miles below Cumberland it is joined by the South Branch, which rises in the centre of Virginia, about 38° 25′ N. lat., and runs north-east for about 100 miles in a valley enclosed between the Alleghany and Kittatinny chains, before it unites with the northern branch. After this junction the Potomac continues to flow in an eastern direction through mountain ranges with great rapidity, until it turns south-east, and before it breaks through the Blue Ridge, the most eastern chain of the Appalachian system, is joined from the south by the Shenandoah, the largest of its affluents, which rises in Virginia, near 38° N. lat. and flows over limestone rocks, in a wide and fertile valley between the Kittatinny and Blue Ridge, for about 130 miles. The united stream passes through the Blue Ridge at Harper's Ferry, by a gap which has all the appearance of being the effect of a violent disruption in the continuity of the mountain-chain. The river now enters the plain country, through which it flows in a south-east direction, with rather a rapid course: the last falls occur a few miles above Georgetown, to which place the tide ascends. Below the head of tide-water the Potomac becomes a deep and wide river, and, passing Washington and Alexandria, it has a general east-south-east course to the Chesapeake

Bay, which it enters in 30° N. lat. At the falls above Georgetown it is ten feet deep, and at Alexandria three fathoms; so that vessels of any burden can ascend to the latter place, and large vessels as far as Washington navy-yard. The whole course of the river exceeds 320 miles: large boats ascend it 50 or 60 miles above Harper's Ferry, and smaller ones much higher.

The Patuxent, the second largest river, rises on the eastern border of the hilly country, in 39° 20′ N. lat. Its general course varies between south-east and south, and it flows about 100 miles; towards its mouth it becomes a bay, from two to three miles wide. It is navigable for vessels of 250 tons to Nottingham, forty-six miles from its outlet, and boats ascend fourteen miles higher, to Queen Anne's Town.

The Patapsco forms the harbour of Baltimore. This river likewise rises in the eastern portion of the hilly region, north-west of the source of the Patuxent; after a course of about thirty miles in an east-south-east direction, it falls over a ledge of rocks, and before it enters Chesapeake Bay it widens into an æstuary ten or twelve miles in length. Vessels of 600 tons can sail to Fell's Point, the lower harbour of Baltimore, and boats may ascend to Elkridge Landing, eight miles above Baltimore.

The Susquehanna river traverses the northern part of Maryland for fifteen miles, before it falls into Chesapeake Bay.

Climate.—The climate is rather mild in the level part of the country, but the winter is severe enough to block up the harbour of Baltimore with ice for some weeks. In this town the range of the thermometer is from 9° to 92°; the mean annual temperature exceeds 53°, being about three degrees higher than that of London. In the level and hilly districts the summer-heat is modified by sea-breezes; but in the valleys between the mountains it is frequently insupportable. These valleys experience very severe winters, being from 500 to 800 feet above the sea-level. The prevailing winds blow from north-west and south-east. Rain is rather abundant, the mean annual fall amounting to about forty inches, and it occurs nearly in equal proportions throughout the year. Drought is rare.

Productions.—Wheat, Indian corn, and tobacco are chiefly cultivated; and rye, oats, and barley less extensively. Vegetables of various kinds are abundant. The common fruits of England, as apples, pears, plums, and peaches, succeed in most places, and are of good quality. Hemp and flax are raised to a considerable extent in the upper valleys. The whole country was originally covered with a dense forest, of which a considerable part still remains, composed of a great variety of trees, especially oak, hickory, ash, walnut, pine, and the tulip-tree. Along the coasts of the Atlantic and the adjacent swamps a wild grape grows, the fruit of which yields a pleasant wine.

The common domestic animals succeed well in Maryland. The wild animals have nearly disappeared from the plains, but in the forests on the mountains wolves, bears, and deer are still found. The wild turkey is still seen in the western districts. The land-tortoise is also common. Fish is abundant, especially in the Potomac.

The principal minerals are coal and limestone. Coal does not occur to the eastward of Cumberland, but west of that town it is abundant. It is found in beds which vary in thickness from one inch to several inches, and sometimes ten feet. Limestone occurs in the whole range of the mountains, and is used for different purposes; sometimes it supplies a good building-marble. Iron-ore is met with in several places, and there are also indications of copper and lead.

Inhabitants.—The native tribes have long since disappeared in Maryland. The present population consists of whites and negroes. In 1820 it was composed of 260,222 whites, 39,730 free people of colour, and 107,398 slaves: in all, of 407,350 individuals. In 1830 it consisted of 343,320 free people, whites and coloured, and of 102,880 slaves; or of 446,200 souls. Since the importation of slaves into the United States has ceased, Maryland supplies slaves for the market of the southern states.

Roads and Canals.—A turnpike-road has been made across the country from Baltimore to Hagerstown, and thence to Cumberland and Wheeling in Virginia. The Chesapeake and Ohio canal is to connect Georgetown in the district of Columbia with Pittsburg on the Ohio, in Pennsylvania. It chiefly follows the course of the Potomac, and in 1834 one hundred and ninety miles were completed, but it had not yet reached the coal region west of Cumberland. The difficulties in carrying the canal over the mountain-ridges suggested the construction of a railroad, which begins at Baltimore, and in 1834 was finished as far as Harper's Ferry; it is still in progress, but we are not informed how far it has advanced westward. Chesapeake Bay is united by a canal to Delaware River. This canal begins in Maryland, on the Elk river, which flows into the most north-eastern corner of Chesapeake Bay, at some distance south of Elkton, and runs about sixteen miles to the Delaware river, where it terminates some miles south of Newcastle. It is calculated for sloop navigation, and has been more expensive than other canals, in consequence of a deep cut of about seventy feet for a considerable distance. A railroad connecting Baltimore with York in Pennsylvania is in progress; when terminated it will be 76 miles long. A branch of the Chesapeake and Ohio railroad runs to Washington; it is 33 miles long.

Political Division and Towns.—Maryland is divided into nineteen counties, of which eight are situated on the peninsula between Chesapeake and Delaware bays. The capital and seat of government is Annapolis [ANNAPOLIS], but the most commercial town is Baltimore. [BALTIMORE.] Other places of some importance are, Fredericktown, near the foot of the Blue Ridge, with 5000 inhabitants and a considerable trade in the produce of the country, it being situated on the turnpike road to Wheeling; Cumberland on the Potomac, in the centre of the mountain-region, has 3000 inhabitants, who carry on trade in iron, lead, and coal. In the eastern districts the largest town is Easton, with 1500 inhabitants and some commerce. Chester and Snowhill are still less important.

Education.—The institutions for the education of the higher classes are rather numerous. As to those in Baltimore, see BALTIMORE, vol. iii., p. 340. There are also St. John's College at Annapolis, and Mount St. Mary's College in Frederick county. The schools for the lower classes are also numerous, and the State has granted considerable sums for their support.

Manufactures are rather numerous, but chiefly concentrated in the neighbourhood of Baltimore. The principal articles made are iron utensils, woollen and cotton goods, hats, paper, ropes, leather, sugar, and tobacco. Vessels are built at Baltimore and Annapolis.

Commerce.—The maritime commerce is almost entirely in the hands of the inhabitants of Baltimore, Annapolis and Easton having only a small portion of it. The exports consist of flour, wheat, rye, and Indian corn, flax-seed and flax-seed oil, salt beef and pork, butter, hog's lard, whiskey, lumber, and a considerable quantity of tobacco, which is greatly esteemed in the European market. The imports are colonial merchandise from the West Indies, wines and spirituous liquors, tea and spices, hardware and some other manufactured goods. The value of the imports from 1st of October, 1832, to the 30th of September, 1833, amounted to 5,437,057 dollars, and the exports to 4,062,467. This commerce employed 156,323 tons of shipping, of which 83,643 entered the ports, and 72,680 cleared out. Two-thirds of this amount of shipping belonged to the United States, and the remainder were foreign vessels. The shipping of Maryland is more than 80,000 tons, of which nearly 50,000 belong to Baltimore.

History.—Maryland was first settled as a place of refuge for the persecuted Roman Catholics of England by Lord Baltimore [BALTIMORE, LORD] in 1634, when 200 Roman Catholics established themselves at St. Mary's, and the country received the name of Maryland from Henrietta Maria, the wife of Charles I. The numbers of settlers soon increased, not only by emigration from England, but also by the addition of non-conformists from New England and Virginia. During the commonwealth the oppression of the Catholics retarded the growth of Maryland, though it enjoyed a more liberal constitution than the other colonies. In 1699 the seat of government was fixed at Annapolis, where it has ever since remained. The constitution of the state was adopted in 1776, and has since been often amended. The legislative body consists of two assemblies, a senate and house of delegates. The members of the senate, fifteen in number, are chosen by forty electors. These electors, who are two for each county, and one for each of the cities of Annapolis and Baltimore, are chosen by the citizens, and elect the senators by ballot out of their own body, or from the mass of citizens. The senators serve for five years. The members of the house of delegates are annually chosen by all the citizens, four for each county, and two for each of the cities of Annapolis and Baltimore. The executive power is vested in a governor and council, consisting of five members, who are elected annually by the joint ballot of the two legislative bodies. Maryland sends two senators and eight representatives to congress.

(Darby's *View of the United States;* Warden's *Account of the United States of North America;* Keating's *Expedition to the Source of St. Peter's River;* Pitkin's *Statistical View of the Commerce of the United States of America.*)

MARYLEBONE. [London.]

MARYPORT. [Cumberland.]

MASA'CCIO, called **MASO DA SAN GIOVANNI**, one of the earliest painters of the Florentine school, was born at San Giovanni in Val d'Arno, in the year 1401, and died in 1443. He was a disciple of Masolino da Panicali, to whom he proved as much superior as his master was to all his contemporaries. He had great readiness of invention, with unusual truth and elegance of design. He made nature his constant study; and he gave in his works examples of that beauty which arises from a judicious and pleasing choice of attitudes, accompanied with spirit, boldness, and relief. He was the first who studied to give more dignity to his draperies, by designing them with greater breadth and fulness, and omitting the multitude of small folds. He was also the first who endeavoured to adapt the colour of his draperies to the tints of his carnations, so that they might harmonise with each other.

He was remarkably well skilled in perspective, which he was taught by P. Brunelleschi. His works procured him great reputation, but excited the envy of his competitors. He died, to the regret of all lovers of the art, not without strong suspicions of having been poisoned. Fuseli says of him—'Masaccio was a genius, and the head of an epoch in the art. He may be considered as the precursor of Raphael, who imitated his principles, and sometimes transcribed his figures. He had seen what could be seen of the antique in his time at Rome, but his most perfect works are the frescos of S. Pietro del Carmine at Florence, where vigour of conception, truth and vivacity of expression, correctness of design, and breadth of manner, are supported by truth and surprising harmony of colour.'

MASANIELLO. [Aniello.

MASCAGNI, PAUL, was born in 1752. He studied medicine in the university of Siena, and in 1774 succeeded his master, Tabarani, in the professorship of anatomy in that institution. He is chiefly celebrated for his admirable work on the absorbent system, and the beauty of his anatomical preparations, of which the greater part are preserved in the Anatomical Museum of Florence. An outline of his great work was published in 1784 in French, under the title, 'Prodrome d'un Ouvrage sur le Système des Vaisseaux Lymphatiques,' and was sent to the Académie des Sciences in competition for a prize offered for the best essay on the subject. In 1787 the more complete work, 'Vasorum Lymphaticorum Corporis Humani Historia et Ichnographia,' was published in folio at Siena. It contains twenty-seven large plates, finished and in outline, of the lymphatics in different parts of the body, engraved with extreme delicacy by Cyro Sancti. It was dedicated to the reigning duke of Tuscany, under whose patronage Mascagni afterwards rapidly advanced in reputation. In 1800 he left the university of Siena for that of Pisa, and the year after went to that of Florence. He died in 1815.

After his death two large works were published from his papers, 'Anatomia per uso degli Studiosi di Scultura e Pittura,' Florence, 1816, and 'Prodromo della Grande Anatomia,' Florence, 1819, by Antommarchi. Mascagni also published works of some celebrity on the lagunes and hot-springs of Tuscany, and on the cultivation of the potato and other branches of agriculture, to which he devoted all his leisure time.

MASCAGNIN, volcanic sulphate of ammonia, occurs stalactitic and pulverulent. Colour yellowish or greyish; taste acrid and bitter; translucent or opaque. Volatilized entirely at a high temperature. Occurs among the lavas of Etna and Vesuvius, &c.

By the analysis of Gmelin it contains—

Sulphuric acid . . .	53·29
Ammonia . . .	22·80
Water	23·91
	100·

MASCLEF, FRANCIS, was born at Amiens, in the year 1662. He very early devoted himself to the study of Oriental languages, in which he attained an extraordinary degree of proficiency. Having been brought up to the church, he became first a curate in the diocese of Amiens, and afterwards obtained the confidence of De Brou, bishop of Amiens, who placed him at the head of the theological seminary of the district and made him a canon. De Brou died in 1706, and Masclef, whose opinions on the Jansenist controversy were not in accordance with those of the new prelate Sabbatier, was compelled to resign his place in the theological seminary and to retire from public life. From this time he devoted himself to study with such close application as to bring on a disease, of which he died, on the 24th of November, 1728, at the age of sixty-six. Though austere in his habits, he was amiable and pious.

Masclef's chief work is the 'Grammatica Hebraica, à punctis aliisque inventis Massorethicis libera,' in which he embodied an elaborate argument against the use of the vowel points. The first edition was published in 1716, and speedily called forth a defence of the points from the Abbé Guarin, a learned Benedictine monk. In the year 1731 a second edition of Masclef's work was published at Paris, containing an answer to Guarin's objections, with the addition of grammars of the Syriac, Chaldee, and Samaritan languages. This work still ranks as the best Hebrew grammar without points. The other works of Masclef were, 'Ecclesiastical Conferences of the Diocese of Amiens;' 'Catechism of Amiens;' and, in MS., 'Courses of Philosophy and Divinity.' The last-mentioned work was not printed, on account of its being thought to contain Jansenist opinions.

MASCULINE and **NEUTER.** [Gender.]

MASERES, FRANCIS. The dates and facts in the following account are taken from 'The Gentleman's Magazine' for June, 1824.

He was born in London, December 15, 1731. His father was a physician, descended of a family which was driven out of France by the revocation of the Edict of Nantes. He was educated at Clare Hall, Cambridge, and took the degree of B.A. in 1752, obtaining the highest place, both in classics and mathematics. He then (having first obtained a fellowship in his college) removed to the Temple, was in due time called to the bar, and went the Western circuit for some years with little success. He was then appointed (the date is not mentioned) attorney-general for Canada, in which province he remained till 1773, distinguished 'by his loyalty during the American contest, and his zeal for the interests of the province.' On his return in 1773 he was appointed cursitor baron of the Exchequer, which office he held till his death. He was also at different times deputy recorder of London and senior judge of the sheriff's court. He died May 19, 1824, at Reigate, in the 93rd year of his age.

Baron Maseres (as he was commonly called) has left behind him a celebrity arising partly from his own writings and partly from the munificence with which he devoted a part of his income to reprinting such works as he thought useful, either in illustration of mathematical history or of that of his own country. These were the objects of his private studies, and a peculiarity of his mathematical views which tinctured the whole of his writings, as well as his selection of works to be reprinted, requires some explanation.

It is well known that the art of algebra grew faster than the science, and that, at the time when Maseres began his studies, a branch of knowledge which is essentially distinct from arithmetic, or rather of which arithmetic is one particular case, had been pushed beyond the simple science of numbers in its methods, reasonings, and results, while its fundamental definitions were allowed to be expressed in arithmetical language, and restricted by arithmetical conceptions. [Negative and Impossible Quantities.] The consequence was, that the algebraical books were anything but logical; and while those who could make for themselves the requisite generalization at the proper time were more likely to employ themselves in extending the boundary of the science than in writing elementary works, all other students had to take a large part of algebra on trust, their faith being built partly on authority, partly on continually seeing verifiable truths produced by its operations. Maseres, when a young man, rejected all of algebra which is not arithmetic, as being what he could not comprehend himself, though he admitted that others might do so. In his earliest publication but one ('Dissertation on the Use of the Negative Sign in Algebra,' London, 1758), which is in fact a treatise on the elements of algebra, after rejecting an equation in which negative quantities occur, he adds: 'I speak according to the foregoing definition, by which the affirmativeness or negativeness of any quantity implies a relation to another quantity of the same kind, to which it is added, or from which it is subtracted; for it may perhaps be very clear and intelligible to those who have formed to themselves some other idea of affirmative and negative quantities different from that above defined.'

The other works of Masères are, 'Elements of Plane Trigonometry,' London, 1750; 'Principles of the Doctrine of Life Annuities,' London, 1783; Appendix to Frend's 'Principles of Algebra,' 1799; tracts on the Resolution of Equations, 1800; various remarks on the tracts published in the 'Scriptores Logarithmici,' presently to be noticed; papers in the 'Philosophical Transactions;' and political writings, a list of which will be found in the 'Genleman's Magazine' above cited. The characteristic of all these writings is an extreme prolixity, occasioned by his rejection of algebra, and the consequent multiplication of particular cases. In his 'Dissertation,' &c. above noticed, the four rules, and the solution of equations of the second and third degree, occupy three hundred quarto pages.

Of the reprints which Baron Masères made at his own expense, the most important is the 'Scriptores Logarithmici,' a collection, in six volumes quarto, published in various years from 1791 to 1807, of writings on the subject of logarithms. Here we find the works of Kepler, Napier, Snell, &c., interspersed with original tracts on kindred subjects. The republication of these old writings has put them in the way of many students to whom they would otherwise have been inaccessible, and has thus tended to promote historical knowledge and to excite inquiry. The 'Scriptores Optici,' 1823, a reprint of the optical writings of James Gregory, Descartes, Schooten, Huyghens, Halley, and Barrow, has a merit of the same kind: it was begun at an earlier period, but having been delayed by circumstances, was completed under the superintendence of Mr. Babbage. Besides these, he also reprinted the tract of James Bernoulli on Permutations and Combinations, and discovered and printed Colson's translation of Agnesi's 'Analytical Institutions.' He also reprinted a large number of tracts on English history. The expense of Hales's Latin treatise on Fluxions, 1800, was defrayed by him, and we understand that more than one other author was indebted to him for assistance of the same kind.

MASHAM, ABIGAIL, the favourite of Queen Anne, noted in the history of the time for her political intrigues, was the daughter of Francis Hill, a Levant merchant of London, who married the sister of Mr. Jennings, the father of the Duchess of Marlborough. Upon the bankruptcy of her father she became the attendant of a baronet's lady, whence she removed into the service of her relative, then Lady Churchill, who procured her the place of waiting-maid to the Princess Anne. She retained her situation after the princess ascended the throne, and by her assiduity and complaisance acquired a great degree of influence over her. The high church principles in which she had been educated contributed to increase her credit with the queen, who was secretly attached to the tory party, though obliged, in the beginning of her reign, to favour the whigs. The marriage of Miss Hill with Mr. Masham (son of Sir Francis Masham, of Otes in Essex) in 1707, occasioned an open quarrel with the Duchess of Marlborough, who was, in consequence of it, deprived of her majesty's confidence. Harley, afterwards earl of Oxford, connected himself with the new favourite; a change of ministry took place, and in 1711 Mr. Masham was raised to the peerage. He and his wife appear to have been actively engaged in the intrigues of the tories in favour of the exiled House of Stuart. Lady Masham lived a long time in retirement after the death of the queen, and died herself at an advanced age, December 6, 1734.

(*Life of Sarah, Duchess of Marlborough*, 8vo., London, 1745, p. 48; *Polit. State of Brit.*, vol. xlviii., p. 656; see also a character of Mr. Masham in Manley's *Secret Memoirs from the New Atalantis*, 12mo., London, 1709, vol. ii., p. 147.)

MASKELYNE, NEVIL, was born in London, October 6, 1732, was educated at Westminster, and afterwards at Catherine Hall and Trinity College, Cambridge, in which university he took the degree of B.A., with distinction, in 1754. In 1755 he took orders, but he had previously been led to turn his attention to astronomy by the solar eclipse of 1748, and by becoming acquainted with Bradley, whom he assisted in the formation of his tables of refraction. In 1761 he went to St. Helena, to observe the transit of Venus, and to detect, if possible, the parallax of the fixed stars. In this voyage, and in one undertaken to Barbadoes in 1764, to try the merits of Harrison's new chronometers, he acquired that knowledge of the wants of nautical astronomy, which afterwards led to the formation of the Nautical Almanac. In 1765 he was appointed to succeed Mr. Bliss as astronomer royal, and from this time, with the exception of his voyage to Scotland in 1772, to determine the mean density of the earth by observing the effect of the mountain Schehallien upon the plumb-line, his life was one unvaried application to the practical improvement of astronomical observation. He died February 9, 1811.

Delambre dates the commencement of modern astronomical observation, in its most perfect form, from Maskelyne, who was the first who gave what is now called a standard catalogue (A.D. 1790) of stars; that is, a number of stars observed with such frequency and accuracy, that their places serve as standard points of the heavens. His suggestion of the Nautical Almanac, and his superintendence of it to the end of his life, from its first publication in 1767, are mentioned in ALMANAC (vol. i., p. 364); his Schehallien experiment, in ATTRACTION (vol. iii., p. 69); and the character of his Greenwich observations, in GREENWICH OBSERVATORY (vol. xi., p. 442).

Dr. Maskelyne, as arbitrator on the part of the government of the merits of the chronometers which were submitted by their makers as competitors for the prize, had more than one public accusation of partiality to bear. The now celebrated Harrison was one of his oppugners, and Mr. Mudge, junior, on the part of his father, another. The only publication (as far as we know) which he ever made out of his official capacity (with the exception of papers in the 'Philosophical Transactions'), was a reply to a pamphlet by the latter, London, 1792. He edited Mayer's lunar tables, and was the means of five thousand pounds being awarded to the widow of the author.

MASON, WILLIAM, born in 1725, was the son of a clergyman at Hull. He took his B.A. degree at Cambridge in 1745, after which he removed from St. John's College to Pembroke, of which college he was elected fellow in 1747. Having taken orders, he was presented to the rectory of Aston in Yorkshire, and became chaplain to the king. His political principles strongly opposed him to the American war, and he was a member of the Yorkshire association for obtaining reform of parliament. The horrors of the French Revolution however are said to have caused a change in his opinions, but as he was growing an old man when it broke out, the timidity of age probably worked as strongly as the reign of terror. He died in 1797, aged 72; having been for years precentor and canon-residentiary of York. There is a tablet to his memory in Poets' Corner, Westminster Abbey.

Mason's Poems are now almost forgotten. Two tragedies, 'Elfrida' and 'Caractacus,' a descriptive poem called 'The English Garden,' and some odes, are his principal productions, but he is now perhaps best remembered as Gray's biographer and friend. His style is that of an imitator of Gray, and not being so perfect an artist in language as his master, he has been proportionally less successful. In addition to his poetical reputation he possessed considerable skill in painting and music, and in the latter subject entertained opinions not at all consonant to those of musicians in general. He wished to reduce church music to the most dry and mechanical style possible, excluding all such expression as should depend on the powers and taste of the organist. (Mason's *Compendium of the History of Church Music.*)

MASONRY (from the French *maison* and *maçon*) signifies both the operation of constructing with stone and the parts of a building consisting of such material. It is a most important branch of architectural practice, because much, both of the durability and beauty of an edifice so constructed, depends upon the excellence of the workmanship and the quality and colour of the stone. Owing to its expense, masonry is comparatively rarely employed
country, except for public buildings or others of th
class, the mason's work being in other cases restri

parts as steps to doors, string-courses, facias, and plain cornices externally, and to pavements and stairs in the interior. Yet that degree of stone-work does not constitute what is termed a brick and stone building, because such term implies a considerable mixture of stone and brick, namely, that the doorways, window dressings, columns, parapets, angle-quoins, and all the ornamental parts are of stone, the *nude* or plain face of the wall only being of brick. But such mode is now fallen into disuse, except for buildings in some of the later Gothic styles, the brick-work being now covered with stucco, cement, or mortar, to resemble as far as possible the stone, when the latter is used for columns, pilasters, and ornamental parts; or, as is now more frequently the case, the whole, even the columns themselves are formed of brick, and afterwards stuccoed. In other instances, while the building itself is entirely faced with stone, all the richer and more elaborate decorations, such as capitals, carved mouldings, and other sculptured ornament, are composed of terra-cotta, or burnt artificial composition, which is said to be not only more economical, but far more durable than stone itself, owing to its being to a certain extent vitrified. This mode has been resorted to with great success for the Ionic capitals of St. Pancras Church, London.

Of all our freestones, Portland stone is perhaps the very best yet discovered, both for durability and colour; but its high price and the expense of working it prevent its being so often employed as could be wished. Of late years therefore Bath stone is the kind more generally made use of for building purposes, it being soft when first taken out of the quarry, and very easily worked. Neither its texture nor tint however is so good; and when discoloured by time, as is quickly the case, it has a certain shabbiness of appearance. In fact a living architect (Mr. A. Bartholomew) describes it, in his 'Hints on Fire-proof Buildings,' as 'the vilest of material, which, when new, is mean and swarthy, and which decays before I myself am old;' and he further mentions St. Bartholomew's Hospital as the earliest instance of the extensive use in London of Bath stone. Ketton stone, which has been used for the tower of St. Dunstan's in the West, Fleet Street, is, though not equal to Portland, greatly superior to Bath stone. Cornwall granites and Dundee stone are now in great requisition for constructions demanding strength and solidity, and have been used in several of the docks and new bridges.

Walls which are not of solid masonry throughout, but built either of brick or inferior stone and rubble, with only an external facing of squared stone laid in courses, are termed *ashler*, or *ashlering*. [ASHLER.]

Rusticated ashler or stone work is that where the separate stones are divided at their seams or joints, which is done either by bevelling off or chamfering their *arrises* or edges to a certain depth, or sinking them by cutting each stone so that it has a general projecting surface, by which means, when united together, those surfaces are flush with the plane of the wall, and the sunk margin round each forms rectangular grooves or channels between them. This latter mode is always adopted when horizontal rustics alone are used, as is now too frequently the practice, for it is not only poor and monotonous, in comparison with rusticating with both vertical and horizontal joints, but unmeaning in itself, and therefore justly condemned by Sir W. Chambers. Though generally made quite smooth, the faces of the rustics are sometimes tooled, or else, though very rarely, *hatched*, *vermiculated*, or *frosted*; all which varieties may likewise be combined, with exceedingly good effect and great diversity, with smooth-faced rustics. Such rough rustics are sometimes distinguished by the name of *bossages*.

Stones inserted quite through a wall, in order to bind it firmly together (in the absence of which the ashlering would be a mere external coating, adhering to the brickwork only by mortar), are called *bond stones*; and those at the base of the wall, projecting beyond its general plane, for the purpose of giving greater solidity just above the foundation, are termed *footings*.

Walls built with unhewn stones, either with or without mortar, are called *rubble walls*, and the stone itself rubble.

MASONS, FREE. According to the extravagant and whimsical hypotheses entertained by some of those who have written upon the subject of freemasonry, it is an institution of almost incredible antiquity. We are told by some that it originated with the builders of the tower of Babel, though others are content with tracing it no farther back than the temple of Solomon. If we are to believe them, the institution has been continued down in uninterrupted succession from that very remote time to the present day, through all the changes of governments, religion, civilization, and knowledge. Against this there exists one very simple, yet fatal, argument, namely, that were this really the case, such an uninterrupted series of tradition must have kept alive and handed down to us much information that has, on the contrary, been utterly lost. Instead of accumulated knowledge, we find that even a technical knowledge of architecture itself has not been so preserved; else how are we to account for the ignorance which everywhere prevailed with respect to Gothic architecture and its principles almost as soon as the style itself fell into disuse? That there may have been many points of resemblance between the fraternities of masons in the middle ages, and such institutions as those of the Eleusinian mysteries, and the corporation of Ionian architects, is not only possible, but highly probable, because similarity of circumstances would almost necessarily lead to it. Before the invention of printing, when the means of communicating knowledge were few and imperfect, no readier mode presented itself of extending and keeping up the speculative and practical information spread among any profession, than by establishing the profession itself into a community or order, all the members of which would have one object and one interest in common. This would be more particularly the case with regard to architecture, which calls for the co-operation of various branches of science and the mechanical arts, and was moreover for several ages the paramount art, all the other arts of decoration being, as far as they then existed, subservient to it.

The importance of architecture to the church, on account of the impressive dignity it conferred upon religious rites and the ministers of religion, naturally induced the clergy to take it under their especial protection. For a long time not only were ecclesiastics the chief patrons but almost the chief professors of the art; yet as they had occasion for the assistance of practical artificers in various branches, they admitted them into fellowship with themselves, establishing a kind of order of a mixed character, just as the orders of chivalry combined at their origin the principles of military and religious discipline. Hence some have supposed freemasonry to have been a branch of chivalry, and to have been established at the time of the Crusades. The more probable hypothesis perhaps is that they were related to each other only in emanating from the same source—from the influence of ecclesiastical power; and their being so derived would alone account for the mystery and secrecy which the guilds of masons affected; and, together with their zeal in accumulating knowledge for themselves, their desire to confine it to their own body.

By means of these associations the inventions and improvements made in architecture were communicated from one country to another, a circumstance which at once accounts for the sudden spread of pointed or Gothic architecture throughout the whole of the west of Europe; and at the same time renders it so exceedingly difficult to determine at all satisfactorily where that style actually originated, or what nation contributed most towards its advancement. Owing also to the jealousy with which the masons kept their knowledge to themselves, it is not at all surprising that the history of the art during the middle ages should be involved in so much obscurity that it can now be traced only by its monuments, all documents relative to the study of it having been concealed as much as possible, even when something of the kind must have been in existence. Among the causes which led afterwards to the decline of these institutions was, on the one hand, the suspicion with which the church itself began to regard them as societies that might in time acquire an influence not easily watched, and which might be turned against itself; and on the other, the spread of information, together with the revival of the arts, which deprived such bodies of their utility and importance, and rendered it impossible for them to confine their knowledge exclusively within their own pale.

In this country an act was passed against Masonry in the third year of Henry VI., at the instigation of the bishop of Winchester. It was however never enforced, and Henry himself afterwards countenanced the brethren by his presence at lodges of masons. It was also patronised by James I. of Scotland: but it was no longer indispensable to the church, which accordingly withdrew its protection—an event that would otherwise have been occasioned by the Reformation.

Freemasonry revived again in this country about the time of the civil war, yet merely in semblance, being altogether different in object and character from what it had been, and becoming merely 'speculative' or modern Masonry, an institution in nowise connected with architectural practice. From this country it was first introduced into France about the year 1725; into Spain in 1728, and into Italy in 1733, when the first masonic lodge was established at Florence. It was afterwards however the object of persecution not only in France and Italy, but also in Holland and Germany. Some writers, more especially Abbé Baruel and Professor Robison, have made it a charge against freemasonry that it has been converted into an organised secret conspiracy against religion and existing governments. If the charge has been unjustly made, it must be owned that the profound mystery in which it has cloaked itself gave some colouring to such charges, it being but natural to infer that if there was anything to call for such extraordinary degree of secrecy, it could hardly be aught for good, or in accordance with the interests of society at large. The greater probability is that there is nothing either good or bad to conceal; that the mystery of freemasonry is nothing more than an innocent mystification; and that its symbols and instructions, whatever meaning or purpose they may originally have had, are now become mere forms and signs retained by the brethren or 'free and accepted masons,' as they style themselves, for the purpose of conferring peculiar importance on their harmless social meetings.

MASORITES. [Hebrew Language.]

MASOVIA. [Poland.]

MASQUE. [English Drama.]

MASQUERADE (from the Italian *mascherata* and French *mascarade*), an amusement introduced into England in the sixteenth century from Italy. Hall, in his 'Chronicle,' says, 'On the daie of the epiphaine, at night (A.D. 1512-13), the king (Henry VIII.) with eleven others were disguised after the manner of Italie, called a maske, a thing *not seen afore in England:* thei were appareled in garmentes long and brode, wrought all with golde, with visers and cappes of golde; and after the banket doen, these maskers came in with the six gentlemen disguised in silke, beryng staffe torches, and desired the ladies to daunce: some were content; and some that knew the fashion of it refused, because it was not a thing commonly seen: and after thei daunced and commoned together, as the fashion of the maskes is, thei toke their leave and departed, and so did the quene and all the ladies.'

The distinction between this species of amusement and the disguisings and mummings of the middle ages appears to have been the general mingling of the company in dance and conversation, in lieu of the execution of a particular dance or preconcerted action by certain individuals for the entertainment of the guests, the latter being as old at least as the time of Edward III. in England, and the precursors of the dramatic masque of the sixteenth century. In 'the garmentes long and brode,' and 'disguisings of silke,' we may perceive the present *domino*, so called, according to some authorities, from an ecclesiastical vestment (a black hood worn by canons of cathedrals), *dominus* being a title applied to dignified clergymen in the middle ages. Others derive it from the ordinary robe or gown worn by Venetian noblemen at that period. Granacci, who died in 1543, is said to have been the inventor of masquerades: at what particular date does not appear; but from the above evidence of Hall, they had become fashionable in Italy as early as 1512.

MASS. By the mass of a body is meant the quantity of matter which it contains, upon the supposition that differences of weight are always the consequence of different quantities of matter. This involves an hypothesis; for instance, if gold be, bulk for bulk, nineteen times as heavy as water, it is presumed that a given bulk of gold contains nineteen times as much matter as the same bulk of water. But it is possible that if we were better acquainted with the constitution of these bodies, it might appear that we are wrong in supposing difference of quantity to be the cause of difference of density.

The fact is, that mass means weight, so that of two bodies, the heavier is that which has the more mass; why then is this word introduced at all? If we had only to consider bodies at the surface of the earth, we might in all cases substitute weights for masses, but when we have occasion to speak of bodies at very different distances from the centre of the earth, their weight towards the earth, which is then called the attraction of the earth, depends upon their distance from the earth, as well as their absolute constitution. If we imagine two planets at the same distance from the earth, the attractions of the earth upon the two will then be in a proportion which depends, not on that distance, but on the amount of matter in the two planets.

When we say that Jupiter has only the 1047th part of the mass of the sun, we express—1, a fact of which observation and deduction make us certain, namely, that at the same distances the attraction of the sun upon the earth is 1047 times as great as that of Jupiter upon the earth; 2, an hypothesis of the following kind, that the sun contains 1047 times as much matter as Jupiter. The hypothesis is a convenience, not affecting the truth or falsehood of results; the fact represented remains, that at the same distances the sun does 1047 times as much towards deflecting the earth as is done by Jupiter.

In the application of mechanics, the following equations frequently occur:—

$$\text{Weight} = \text{mass} \times \text{force of gravity}.$$
$$\text{Mass} = \text{volume} \times \text{density}.$$

These equations, like others of the same kind, are to be understood with tacit reference to the units employed; they spring from the following proportions. Any two masses are to one another in the ratio compounded of that of the volumes and that of the densities; thus the two bodies being eight cubic feet three times as dense as water, and seven cubic feet four times as dense, the masses are in the proportion of 8×3 to 7×4, or of 24 to 28. Again, if two different masses be acted upon by pressures which would, in a unit of time, create different amounts of velocity, the pressures are to one another in the ratio compounded of that of the masses and that of the velocities which would be generated in the unit of time. Thus if the preceding masses, which are as 24 to 28, were subjected to attractions which would produce in single particles velocities of 10 and 11 feet, if allowed to act uniformly for one second, the pressures requisite to prevent motion at the outset would be as 24×10 to 28×11, or as 240 to 308.

To convert these proportions into equations, let the unit of time be one second, that of volume one cubic foot, and let water be the substance which has the unit of density; also let the unit of length be one foot. Then if the unit of mass be one cubic foot of water, and the unit of weight the pressure necessary to restrain a unit of mass acted on by an attraction which would, in one second, give a velocity of one foot per second—the preceding equations are true. [Weight; Specific Gravity; Acceleration.]

MASS (*Missa*, in Latin). The derivation of the word 'missa' has been variously accounted for; some derive it from missio or dimissio, 'dismissal,' because in the early ages of the church the catechumeni, or new converts who were not yet admitted to partake of the sacrament, were sent out of the church after the liturgy was read, and before the consecration of the Host. Others derive it from the Hebrew word 'Missah,' *i. e.* oblation or sacrifice in commemoration of the sacrifice of our Redeemer for the sins of mankind. Ducange, in his 'Glossarium,' art. 'Missa,' gives the various opinions on the etymology of the word. The word missa, signifying the ceremony or rite of consecrating the Host, is found in the epistles of St. Ambrose, St. Augustine, and Cesarius, bishop of Arles. See also Baronius, in his 'Annals.'

The mass is a church service which forms an essential part of the ritual of both the Roman Catholic and Greek or Eastern churches, and in which the consecration of the sacramental bread and wine takes place. It is performed entirely by the officiating priest standing before the altar, and attended by a clerk who says the responses. The prayers of the mass are all in Latin in the Roman Catholic church, in antient Greek in the Eastern church, and in Syriac among the Maronites and Jacobites, but never in the vulgar or vernacular tongue of the country. The congregation take no ostensible part in the service, but they follow it mentally or in their prayer-books, in which the text of the prayers is occasionally accompanied by a translation in the vulgar tongue. The priest does not address the congregation, but has his back turned to them, except at the end of certain prayers, when he turns round, and says 'Dominus vobiscum' ('The Lord be with you'), and at 'Orate Fratres,' &c. ('Brethren, pray,' &c.), which a sponded to, on the part of the congregation, by the

The mass consists of various parts—1, the Introitus, or preparation, consisting of several prayers, psalms, the 'Gloria in excelsis,' the epistle and gospel for the day, the Creed, &c., which the priest recites with a loud voice. 2, The consecration, in which the priest consecrates the bread and wine, repeating the words, 'Hoc est corpus meum, et hic est calix sanguinis mei,' and then shows to the people both the bread and the chalice containing the wine, upon which all the congregation kneel down. 3, The Communion. The priest, after reciting more prayers, accompanied by an invocation of the apostles and other saints, the Lord's Prayer, &c., takes the sacrament under both forms; if any of the congregation are disposed to take the sacrament, the priest then descends from the altar and administers it to them in the shape of the consecrated wafers or bread only. 4, The post communio, which consists of a few more prayers, and of the blessing which the priest gives turning towards the congregation, after which he reads the first chapter of the gospel of St. John down to the fourteenth verse, and the mass is over.

The low or ordinary mass, *Missa brevis*, lasts in general about half an hour, and every Roman Catholic is bound, by what are styled the 'Commandments of the Church,' to attend it once at least on Sundays and other holidays, unless prevented by illness. The transgression of this precept is reckoned a sin. Pious persons hear several masses in succession, and many attend mass every day in the week, for it is celebrated every day in each parish church. A priest must not break his fast either by food or drink from the previous midnight until he has said mass, out of respect for the real presence of Jesus Christ in the sacrament. The service of the mass is indeed essentially connected with and depends on the doctrine of transubstantiation. [TRANSUBSTANTIATION.]

On great festivals and other solemn occasions the mass is performed by a priest or prelate, attended by a deacon and subdeacon, who says the responses and chants the epistle and gospel of the day. On those occasions the mass, or at least parts of it are sung by a choir, accompanied by the organ and other musical instruments. This is called 'high mass,' and is a long and pompous service. Both for the low and the high masses the officiating priest is dressed in peculiar various-coloured garments appropriated to the occasion, which he afterwards takes off in the vestry-room.

The 'Missale' is the name of the book which contains the ritual of the mass, and which the priest holds open before him on the altar. Some of the old Missals, whether MSS. or printed, are beautifully ornamented with paintings, and are valued as bibliographic curiosities.

The Protestant and reformed churches have no mass, as they do not believe in the doctrine of transubstantiation; but several of the detached 'Oremus,' or prayers of that service, which are very fine, have been retained in the Liturgy of the Church of England translated in the vulgar tongue.

MASSA, DUCHY OF, a small territory on the west coast of Italy, which, with the annexed territory of Carrara, constituted for a long time a sovereign principality under the family of Cibo. It now belongs to the duke of Modena. [CARRARA.] The territory of Massa extends about eight miles from the sea-coast to the Alpe Apuana or mountain-group which divides it from the province of Garfagnana, part of which also belongs to Modena. [GARFAGNANA.] To the south-east Massa borders upon the territory of Pietrasanta, belonging to Tuscany; and on the north-west it adjoins Carrara: its breadth between these two limits hardly exceeds six miles. The small river Frigido flows through the territory of Massa from the mountains of Carrara to the sea. The town of Massa is in the lower part of the country, not far from the sea, on the high road from Genoa to Lucca and Pisa. It is surrounded by fine gardens and plantations of fruit-trees. Massa is a neat town: it is also a bishop's see, has a cathedral with some good paintings, a town-house, a fine public garden with orange-trees, and a handsome marble bridge over the Frigido. It is the residence of the governor sent from Modena, and has a court of appeal for the duchy of Massa and Carrara. Massa and its territory contain from 9000 to 10,000 inhabitants.

MASSACHUSETTS, one of the United States of North America, lies between 41° 31′ and 42° 52′ N. lat. and 69° 50′ and 73° 50′ W. long.; but the two islands of Martha's Vineyard and Nantucket, which belong to it, extend as far south as 41° 12′. The Atlantic Ocean washes its eastern and southern shores to the extent of 270 miles, if the numerous inflexions and inlets are taken into account. On the south, Massachusetts is bounded by Rhode Island, with which it has a common boundary-line of 69 miles, and by Connecticut, which forms its boundary for 85 miles. On the west the boundary-line formed by New York rather exceeds 50 miles. North of Massachusetts are Vermont and New Hampshire, which respectively form its boundary for 38 and 85 miles. Its length from Plymouth harbour on Cape Cod Bay, along the southern border to New York, is about 145 miles, and its mean width about 50 miles. Its surface is 7335 miles, or nearly the area of Wales.

Shores and Islands.—Narraganset Bay, which lies chiefly within the state of Rhode Island [RHODE ISLAND], enters by its most north-eastern inlet into Massachusetts, where it receives the Taunton river, the most considerable of all the streams which fall into that bay; the tide ascends this river to Dighton, eight miles above its mouth. Farther east is Buzzards Bay, a deep indentation stretching in a north-eastern direction into the mainland. From its entrance between Seaconet Point and the south-western of the Elizabeth Islands, to its innermost corner, it is 35 miles long, but it lessens in width from ten miles to one mile. The innermost corner is divided from Cape Cod Bay by an isthmus five miles in width. This bay is very much indented by small bays on both shores, but it is shallow, especially towards its inner part; yet vessels of considerable draught may ascend to New Bedford, 16 or 17 miles from its entrance. The shores are low and sandy. On the east of Buzzards Bay begins Barnstable Peninsula, which first stretches from the mainland, a little north of east, 35 miles, varying in width from 3 to 20 miles: it then changes its direction to north and north-west, for about 30 miles, with a mean width of 2½ miles, and terminates in Cape Cod. The difference in the rise of the tide, south and north of the peninsula, is remarkable. In Buzzards Bay and in Nantucket Bay it rises from 3½ to 4 feet, and in Cape Cod Bay to 16 feet. Barnstable Peninsula encloses the southern portion of a large bay, which is generally called Massachusetts Bay, though at present that name is limited to the northern portion of it, and the southern, which is enclosed by the peninsula, is called Barnstable Bay or Cape Cod Bay. This large bay extends northwards to Cape Anne in the form of a parallelogram, 55 miles long from south-south-east to north-north-west, and 25 miles in width. From Cape Cod to Cape Anne it is open 44 miles to the Atlantic. It contains the important harbours of Plymouth, Boston, and Salem. North of Cape Anne the shores are somewhat high and rocky.

South of Barnstable Peninsula are the islands of Nantucket and Martha's Vineyard. Nantucket is about 15 miles in length and 4 in breadth, rises to a very moderate height, and is level. Its sandy soil is almost entirely sterile, and the inhabitants live by fishing. It constitutes a separate county, inhabited by 7286 souls in 1820. Martha's Vineyard is about 16 miles in length and 8 in its greatest breadth; the surface is level and the soil sandy, but productive in some places. Together with some smaller islands lying near it, Martha's Vineyard constitutes Dukes County, which in 1820 contained 3295 inhabitants. The wide bay which is enclosed by these islands on the south, and by Barnstable Peninsula on the north, is called Nantucket Bay.

Surface and Soil.—The surface of the Barnstable Peninsula is level, or rather consists of two inclined plains, which attain some elevation where they meet. Between Hyannas harbour and Barnstable, the highest level is about 80 feet above low-water in Nantucket Bay; but on the isthmus which unites the peninsula to the continent, it is only 40 feet. The soil of this tract is sandy and light, and of an inferior quality, but cultivated with great industry. The country along the western side of Buzzards Bay and the shores of Massachusetts Bay is similar in soil. But this flat country rises rapidly inland, so that the tide, though it amounts to 16 or 18 feet, is only perceptible from 5 to 10 miles from the sea in the rivers. At the back of this level tract is a hilly region, which in the north-eastern districts extends nearly to the shores of the sea, and westward to the valley of the Connecticut river. Its surface is agreeably diversified by hills and depressions; the soil of the latter is deep and strong, and cultivated with considerable care. In this part some hills rise to a considerable elevation, the highest, Mount Wachuset, attaining nearly 4000 feet. Hills of smaller elevation extend towards the Connecticut river, but they approach the banks of the river only near Northampton and Hadley. North and south of these places the Connecticut runs through a valley, from two to three miles wide, which is covered by an alluvium of great fertility. West of it the country immediately rises into high hills, which gradually attain the elevation of mountains; Berkshire, the most western district of the state, being traversed from north to south by two continuous ridges, whose more elevated parts are from 3000 to 4000 feet high. The valleys of this district have a very fertile soil.

Rivers.—The western and mountainous region is traversed by the Houssatonick, which rises near the north-western corner of the state, and traverses it by a southern course of nearly 50 miles, when it enters Connecticut; it is a very rapid river and not navigable in Massachusetts. The Connecticut enters Massachusetts from New Hampshire, and traverses it by a course of about 70 miles, including its numerous bends. It is navigable for boats in the whole of its course in Massachusetts. [CONNECTICUT.] No considerable river falls into Massachusetts Bay. Charles river, which falls into Boston harbour, though its whole course does not exceed 30 miles, is navigable for about eight miles for large boats, the tide flowing up to Dedham. The Merrimac rises in New Hampshire on the western declivities of the White Mountains, north of 44° N. lat., and runs nearly due south, 50 miles, when it receives a branch from Winnepisseogee lake, and then runs for 52 miles south-south-east, till it is met by the Nashua river from the south-south-west. Below the junction with the Nashua, the Merrimac curves gradually to the east for 12 miles, and afterwards runs to the north-east about 30 miles, when it falls into the Atlantic after a course of more than 150 miles. In its natural state the Merrimac opposed great impediments to navigation. The tide ascends to Haverhill, 18 miles from its mouth, but above it the course of the river is obstructed by several falls and rapids. The lowest is below Chelmsford, where the river falls over a ledge of rock, to avoid which a canal with three locks has been made. Between this ledge of rock and Haverhill the stream, though still rapid, is navigable. Numerous falls and rapids occur within New Hampshire, all which are now avoided by canals. The number of these canals is eleven, and an uninterrupted navigation has thus been effected as far up the river as Concord in New Hampshire. The importance of this river for internal navigation has been much increased by the Middlesex Canal.

Climate.—The climate of Massachusetts is much colder in winter, and warmer in summer, than the southern districts of Great Britain, though the difference of latitude amounts to about nine degrees. The mean temperature seems to be 48°, or about two degrees less than that of London. The winter commences about the middle of December and terminates about the middle of March. In this season the thermometer commonly ranges between 43° and 10°, and sometimes descends below zero of Fahr.; snow covers the ground and the rivers are frozen hard enough to bear loaded waggons. The spring terminates in the middle of May. The summer is hot, and at the solstice the thermometer frequently rises to 77° every day for a month and more; sometimes it attains 90° and even 100°. In the same season it sometimes descends in the night to 60°, whilst at noon it is 90°. The summer lasts to the beginning of October, when the weather grows rapidly colder. The prevalent winds are from the north-west and north. The north-west wind prevails during the whole year, except the summer, when the wind blows mostly from the south or south-west. In winter the coldest wind is from the north-west. Rains are more abundant in winter than in summer. The annual quantity amounts to more than 40 inches, which is nearly double the quantity that falls in many places on the continent of Europe. Yet it is stated that the number of rainy days is fewer in Massachusetts than in most countries of Europe. Slight shocks of earthquakes are not uncommon.

Productions.—As Massachusetts was early settled, a greater portion of its surface is cultivated than in most of the other states, and agriculture has been more improved. The farms generally average from 100 to 200 acres. The principal agricultural productions are, Indian corn, rye, oats, potatoes, hemp, flax, peas, hops, beans, and pumpkins, which last are used as food for swine and cattle. Wheat, buckwheat, and barley are raised only in small quantities. Forests still cover a considerable portion of the surface. In the plains there are only pines, the white pine on a soil consisting of light loam, and the yellow pine on sand and gravel. The hilly and mountainous country produces oak, walnut, birch, maple, ash, cedar, cherry, and chesnut. In the valleys and on the banks of the rivers there are elm, cherry, maple, and aspen. Some marshy places are covered mostly with white cedar. All the fruit-trees of England are cultivated.

The cattle and the hog are of a good size, especially the former, in the mountainous and hilly country west of Connecticut river. Wolves are still found in the hilly region. Fish abound in the rivers and in the sea. The whale fishery in the sea between Massachusetts and the Great Bank of Newfoundland is still important, though the larger kinds of whales have disappeared, and only the black fish (Delphinus globiceps, Cuv.) comes there in shoals, and is taken in considerable numbers by the inhabitants of Nantucket, and the vessels sent from New Bedford in Buzzards Bay. The fishery of cod in Massachusetts Bay and on the banks near Nantucket is still more important, and also that of mackerel. The other fish abounding in the same tract of sea are haddock, herring, halibut, and sturgeon. Lobsters, crabs, and some other shell-fish abound in Massachusetts Bay.

Iron occurs in several places, but is not much worked. There are some traces of copper and lead. Limestone abounds in Berkshire, where some good marble also occurs. Slate is found in one or two places.

Inhabitants.—The population, which during the last century increased very rapidly, at present increases more slowly. The emigration towards the west is considerable. In 1820 the population amounted to 521,725, and in 1830 to 610,408 individuals. According to the last census there were 81 individuals to each square mile. In 1837 it had increased to 691,222 individuals, or more than 94 to each square mile. Massachusetts has no slaves.

Canals and Railroads.—The Middlesex canal begins at Charlestown opposite Boston, and terminates at Chelmsford on the Merrimac; the length is 27 miles; the width at the surface thirty, and at the bottom twenty feet; the depth is three feet. The highest level is 104 feet above Boston harbour. By this canal the countries on both sides of the Merrimac are united with the town of Boston. The Blackstone canal extends from Worcester (which is about half way between Boston and the Connecticut river) to Providence in Rhode Island; the length is 44 miles, of which sixteen are in Rhode Island. The Hampshire and Hampden canal branches off from the Connecticut river at Northampton, and unites with the Farmington canal at the southern boundary-line of Massachusetts; the Farmington canal, which may be considered as its continuation, traverses the state of Connecticut in its whole breadth, terminating at New Haven. The whole line is about 80 miles long, of which about thirty are in Massachusetts.

The Quincy railroad, the first road of this description made in the United States, was constructed for the purpose of transporting the granite of that town to the tide-water; it is 3 miles long. A railroad intended to unite the town of Boston with Albany on the Hudson river in New York, has been completed to Worcester, about 40 miles. Another railroad is constructing from Boston to Lowel, 30 miles; and another from Boston to Providence in Rhode Island, about 40 miles; probably both are completed.

Manufactures.—The manufactures of this state are more considerable than those of any other state of the Union, if its extent and population are considered. The most important branch is the construction of vessels; but the manufactures of cotton and woollen goods, of paper, leather, iron, and glass are also very extensive. Boston has some rope manufactures, sugar-houses, and train-oil distilleries, of which last there are also some in New Bedford and on the island of Nantucket. Straw bonnets are made by the country people in some districts. There are 250 incorporated manufacturing companies in the state.

Commerce; Navigation; Fishery.—The commercial relations of this state, both with foreign countries and the other states of the Union, are extensive and important. The most important articles of export are dried and salt fish, train and spermaceti oil, salted beef, flour, soap, candles, leather, and cotton goods. The imports consist mostly of colonial goods, brought from the West Indies, as coffee, sugar, molasses, indigo, iron, and hemp, together with the manufactured goods of England, especially silk, linen, and woollen. The countries of Europe which the vessels of this state principally visit are England, Russia, and Sweden; from the two latter countries they import great quantities of iron; they also visit China, Brazil, and the English, Spanish, and Danish islands in the West Indies. Massachusetts has more foreign trade than any state of the Union, except New York, and the tonnage of its shipping exceeds even that of New York. By an agreement entered into with England in 1818, the inhabitants of the United States are permitted to fish cod on the western coasts of Newfoundland, the Straits of Belleisle, and the coasts of Labrador; and in this branch of fishery, together with that of the mackerel, more than 1000 vessels and boats belonging to Massachusetts are engaged. New Bedford and the island of Nantucket also send about 250 vessels to the whale and sperm fishery, the tonnage of which amounts to more than 80,000 tons; and when the several vessels are added, which are supplied by Boston, Salem, and Plymouth, the shipping employed by this state, in this branch of industry, probably exceeds 100,000 tons.

The total of the imports from 1st of October, 1832, to 30th of September, 1833, amounted to 19,940,911 dollars, and that of the exports to 9,683,122 dollars, of which latter 5,150,584 dollars were of domestic produce, and 4,532,538 dollars of foreign produce, which clearly shows that many of the states lying farther west receive their imports by way of Massachusetts, but export their produce by another road. In carrying on this trade, more than 225,000 tons of American and somewhat more than 30,000 tons of foreign shipping were employed.

Political Division and Towns.—The state is divided into 28 counties; the capital is Boston. [BOSTON.] Round the Bay of Boston, whose entrance is formed by Point Alderton on the south, and Point Shirley on the North, are some important places, as Quincy, which has quarries of granite, and 4000 inhabitants; Cambridge, the seat of Harvard College, with 6071 inhabitants; and Charlestown, with 8783 inhabitants, and a dockyard belonging to the general government. Cambridge and Charlestown are united to Boston by bridges, and may almost be considered as suburbs. Farther north along the shore is Lynn, with 7000 inhabitants, and extensive manufactures of shoes; Salem, built on a peninsula in Marblehead Harbour, has an extensive commerce, especially with the East Indies, and 13,836 inhabitants; Gloucester, on the south-side of Cape Anne, has a spacious harbour, with 7518 inhabitants, and is engaged in the fisheries; and Newbury Port, a well-built place at the mouth of the Merrimac, with 6388 inhabitants, who are engaged in fishing and commerce. On the shores of Barnstable Bay is Plymouth, with a good harbour; it was the first settlement in the colony, and contains 4751 inhabitants. Barnstable has 4000 inhabitants, and is engaged in the fisheries. On Buzzards Bay is New Bedford, with 7592 inhabitants, who are extensively engaged in the whale fishery and in the manufacture of spermaceti candles and salt. In the interior is Lowell on the Merrimac, with extensive manufactures of cotton and wool; in 1833 more than 36,000,000 yards of cotton goods were made here. Worcester, near the centre of the state, where the railroad and the Blackstone canal meet, has 4172 inhabitants, and some internal commerce. Northampton, on the Connecticut river, has 3613 inhabitants and large tan-yards. Pittsfield, on the banks of the Houssatonic, near the boundary of New York, has 3570 inhabitants, with manufactures of iron and considerable trade.

History.—This part of the American continent was probably discovered by John Cabot at the end of the fifteenth century, but though visited several times during the following century, no settlement was made. A company was chartered by James I. in 1606, to which this country was granted under the name of North Virginia. The first settlement however was only formed in 1620 at Plymouth, by about 120 families of non-conformists, who had fled to Holland, and thence proceeded to Cape Cod. They framed a constitution, and took an oath to keep it. It afterwards became the groundwork of the constitution of the state. The first regular house of representatives was organised in 1639. The progress of the colony was very slow in the beginning, especially on account of the oppression to which the inhabitants were subjected during the reign of the Stuarts, before the time of the Commonwealth and after the Restoration. Though they were relieved by the Revolution of 1688, and the increase of the colony was thus promoted, its population in 1730 did not exceed 120,000 individuals. Since that time however it has improved rapidly. In the Revolutionary war Massachusetts took a leading part, by resisting the demands of the English government, and creating a military force. Hostilities were commenced by the battle of Lexington. It adopted a new constitution in 1780, and after Maine, which up to 1819 formed a part of the state, had been separated from it, the constitution was amended for the last time in 1820. According to this constitution the legislature consists of a senate and a house of representatives. The senate is chosen by the counties, each citizen possessed of landed property to the amount of 60 dollars having a vote; but the number of the senators to be chosen by each county depends on its quota of taxes. The other house is chosen by the towns, according to their population, each citizen possessed of 60 dollars having a vote. In 1830 there were 40 senators and 501 representatives. The executive power is vested in a governor, lieutenant-governor, and nine counsellors. The first two officers are chosen annually by the citizens, and the counsellors by the joint ballot of the two houses from among the persons returned as senators. Massachusetts sends two members to the senate and thirteen to the house of representatives at Washington.

Education.—As generally in the United States, the education of the lower classes is an object attended to by the state. For that purpose the State is divided into small townships, or separate corporations, of from five to seven miles square, and the number of these townships amounts to 305. But that the distance which children have to go to attend school may not be too great, each township is divided into smaller districts. In each a school is established, which in summer is attended by the younger children, and conducted by a woman; but in winter it is visited by children from ten to fifteen years old. The children are instructed in orthography, reading, writing, English grammar, geography, and arithmetic. The number of these schools amounts to about 3000; and in winter they are attended by more than 140,000, and in summer by upwards of 120,000 children. These common schools, as they are called, are wholly supported by a tax upon the people. The number of academies or private schools amounts to 854, but a great proportion of them are small establishments, kept in the interval between the winter and summer terms of the district schools. Some larger institutions of this description are attended by the children of wealthier parents, who wish to give them a greater amount of useful knowledge. Their number amounts to more than 60. Among the learned institutions is Harvard College at Cambridge, three miles from Boston, the best endowed institution in the United States; it has an anatomical museum, a botanical garden, a collection of minerals, and a library of 35,000 volumes. There are at present thirty instructors and about two hundred and thirty students. Other collegiate institutions are Williams College at Williamstown, with seven instructors and about one hundred and twenty students; Amherst College, with twelve instructors and two hundred and sixty students; the Theological Seminary at Andover, which has a deservedly high reputation, and the Newton Theological Seminary.

(Darby's *View of the United States*; Warden's *Account of the United States of America*; Pitkin's *Statistical View of the Commerce of the United States of America*; *Journal of Education*, 'On the New England Free Schools,' vol. ii.; *American Almanac*; 'An account of the Common Schools in the States of Massachusetts,' &c., in the 3rd publication of the Central Society of Education.)

END OF VOLUME THE FOURTEENTH.

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